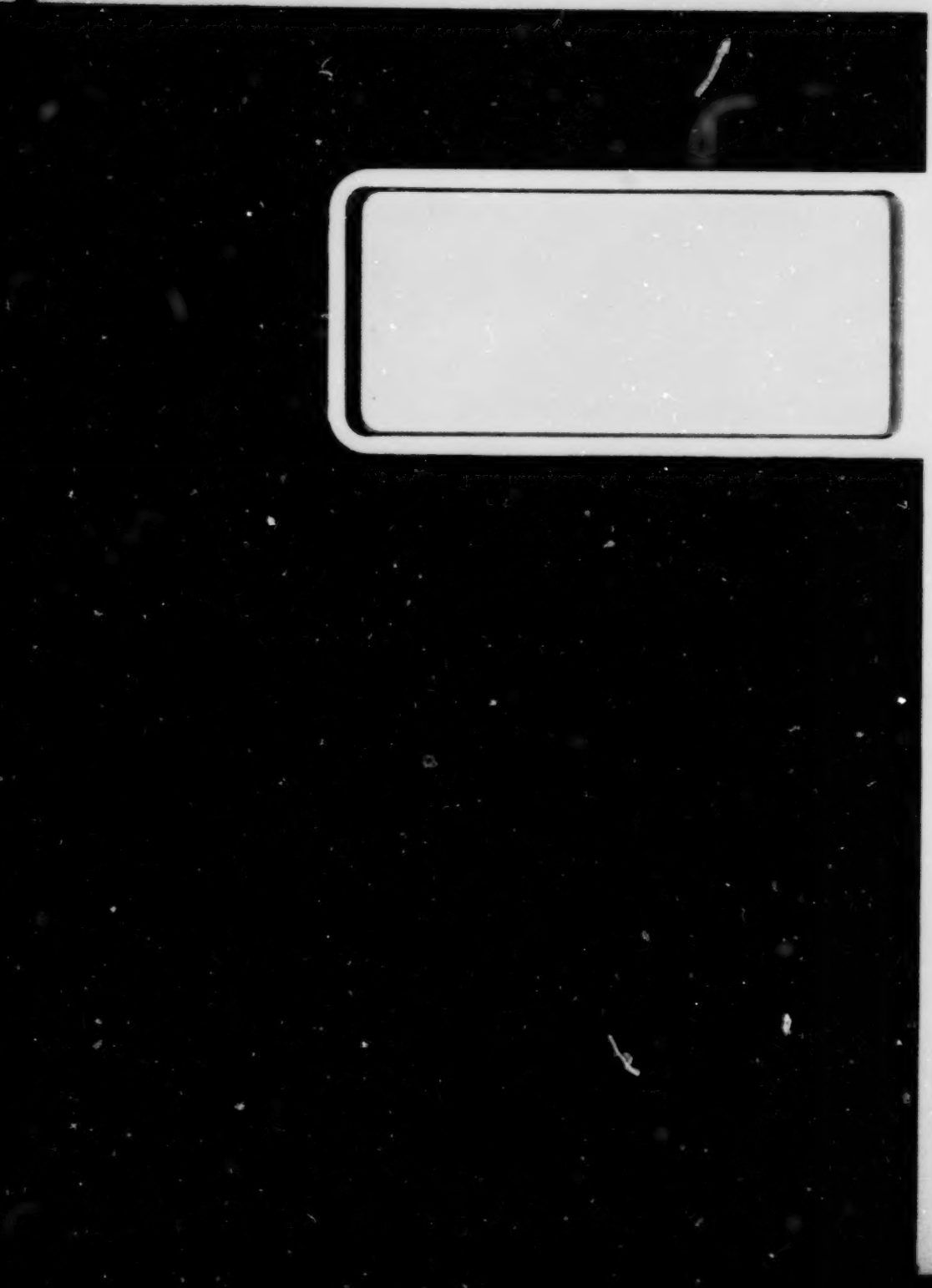
Final report

OWMC
Ontario Waste Management Corporation

A provincial crown corporation.



Gartner Lee Associates Limited

SITE SELECTION PROCESS
PHASE 3B: SELECTION OF CANDIDATE SITES
BIOLOGY

FOR

ONTARIO WASTE MANAGEMENT CORPORATION

BY

GARTNER LEE ASSOCIATES LIMITED

OCTOBER, 1984

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October 31, 1984.

Ontario Waste Management Corporation,
2 Bloor Street West,
11th Floor,
Toronto, Ontario.
M4W 3E2

Attention: Dr. B. D. Mitchell, Director,
Corporate Planning and Development

Dear Sirs:

Re: Phase 3B: Selection of Candidate Sites
- Biology Report

We are forwarding two copies of our final draft of the Phase 3B Biology Report. This report describes the use of biology factors in the selection of candidate sites.

The report identifies biology factors, explains the rationale and approach used in their development and evaluates their significance to aid in the selection of candidate sites. The reader should refer to similar reports on other site selection factors and to the report describing the site selection process, to develop a full understanding of the process and factors applied.

Maps which will be contained in the Map Portfolio have been finalized.

/cont'd.

We trust that this report meets the Corporation's requirements.

Yours very truly,

GARTNER LEE ASSOCIATES LIMITED

D. S. Osmond, B.Sc.Agr.,
Associate.

DSO:dc
encl.

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BIOLOGICAL RESOURCES

STUDY TEAM

This study was carried out under the direction of Grant Anderson, Project Director, Gartner Lee Associates Limited (GLAL). The study team consisted of:

David Osmond, B.Sc.Agr.	-	Associate and Senior Biologist of GLAL - Report Writing and Review
Kenneth Dance, M.Sc.	-	Senior Biologist of GLAL - Report Writing and Project Management
Wayne Weller, M.Sc.	-	Biologist of GLAL - Environmental Resources Inventory
Thomas Hilditch, B.Sc.Agr.	-	Biologist of GLAL - Inventory and Analysis

EXECUTIVE SUMMARY

PURPOSE OF THE REPORT

- To identify those biology factors which, in conjunction with other environmental, planning and engineering factors were used for the selection of candidate sites, keeping in mind OWMC's site selection goals and objectives.

- To explain the rationale and approach used in the identification of biological factors in the various stages associated with the selection of candidate sites.

- To evaluate the significance of such factors to aid in defining smaller units within the candidate areas and site areas and in defining boundaries of potential sites and in comparing them.

SCOPE AND METHODS

- Biological factors were among numerous considerations used to attain goals and objectives of the site selection process.

- Selection of biology factors was related to OWMC goals and objectives for the site selection process.

- The study relied heavily upon published information sources, augmented in later stages by roadside observations made during brief field visits. Findings were <u>not</u> confirmed through on-site field study.

- Biology factor identification and application related to the three stages of the candidate site selection process which successively defined smaller units within candidate areas. These stages were:

  (i) identification of site areas,

  (ii) identification of potential sites,

  (iii) identification of candidate sites.

- Data on biology factors which were identified in the first stages of the candidate site selection process were often carried through and applied in the stages which followed.

IDENTIFICATION OF SITE AREAS

- Biological resources documented in the constraint mapping stage include those inside and generally within 1 km outside the candidate area boundaries.

- The distribution of biological factors for constraint mapping purposes was plotted on 1:50,000 scale topographic maps and presented in the map portfolio.

- Boundaries of larger forested areas were determined from airphotos.

- Status of published data used in this stage was confirmed through discussions with representatives of many of the agencies with jurisdiction.

- Biological resource factors which were identified for constraint mapping purposes were ranked.

IDENTIFICATION OF POTENTIAL SITES

- In the first step of the "site screening" stage, constraint mapping information at a 1:50,000 scale was interpreted and used to define smaller units within candidate areas to reduce the number of potential sites.

- Experts familiar with the status of certain woody plant species in southern Ontario were contacted.

- Coincident with a change in mapping scale to 1:10,000, the biology factors on 90 site areas were briefly checked by roadside observations made during field visits in December 1983, January, April, and July, 1984.

- General site-related field visits and change to the larger scale maps allowed the development and use of new biology factors.

- Site areas were assigned general constraint ratings using biological information.

IDENTIFICATION OF CANDIDATE SITES

- Assessment of biological resources of the 16 potential sites identified for "initial comparative evaluation" involved an airphoto interpretation to characterize vegetation, an office check of boundaries and field observations made during the identification of potential sites and a review of potential access routes to the sites.

- No additional field work or on-site study was conducted.

- The reduction in the number of potential sites to 16 allowed refinement of factors applied during site area screening and addition of other factors related to site vicinity and potential access routes.

- Potential sites and access routes were grouped according to level of constraint presented by the significance of biological resources present.

- Assessment of constraint related to the occurrence of biological resources documented in the literature, wooded areas and aquatic or terrestrial habitat which, in the opinion of a biologist, would be of value to wildlife.

PREMISES AND POSTULATES

- Biological resource factors were developed in response to the OWMC goals:

  (i) to minimize risk to human health; and

  (ii) to minimize environmental impacts.

- Site selection objectives were developed to fulfill OWMC goals. Those which contributed to the development of biology factors were to avoid destruction and minimize disruption of:

  (i) significant natural ecosystems,

  (ii) significant vegetation or wildlife populations,

  (iii) rare or uncommon species of plants and animals,

(iv) significant landforms and their physical features.

As well, a final objective

(v) was to site facility components to minimize potential contamination of food chains in the environment.

- Ranking of biology factors was based on level of confidence in the data base and OWMC goals and objectives; governmental policy and guidelines as well as input from public workshops were other considerations used in factor ranking.

- Candidate areas studied during the identification of site areas were based on the 19 identified in the Interim Phase 3 Report (May, 1983) plus the "Claireville" area identified in January, 1984; the number and location of areas to be evaluated during site area screening and identification of candidate sites were provided to us by the site selection management team following discussions with the various consultants.

- Access to properties was not intended in Phase 3; hence, the study was completed under the postulate that secondary sources would be the main data base, augmented by brief roadside field visits.

- We postulated that forested areas represent important plant and animal habitat. Based on Galli et al. (1976), 20 ha (50 acres) appeared to be a reasonable size of woodlot to support a variety of forest wildlife species.

- During the biological assessment of potential sites, no distinction was made between the portion of the site where facilities would be placed and the remaining lands within the proposed site. We viewed all lands within the acquisition limit as "the site" from a biology factor perspective. During final site evaluation locations of biological features relative to facility placement were considered.

- The study was based on the postulate that through the identification of important biological resources, they could either be avoided in the site selection process or flagged for study in greater detail in later stages to ensure their protection through proper site design and management.

STATUS OF DATA

- Contact with the public, agencies and interest groups was limited at this stage of the process; thus, there are undoubtedly additional sources of local and detailed information which have not yet been reviewed.

- It is possible that more detailed site-specific studies may result in a shift in designation of biological resource significance through the discovery of previously undocumented attributes such as rare or uncommon species or through the absence of features which had been found in the past.

- While more detailed site-specific study will be required to verify published information, available secondary source biological data provide an adequate base for the identification of candidate sites.

IDENTIFICATION OF SITE AREAS

- Data sources include Environmentally Significant/ Sensitive Area (ESA) studies, Ministry of Natural Resources (MNR) District Land Use Guideline documents, reports which map Areas of Natural or Scientific Interest (ANSIs), fish migratory route maps with updates from MNR Fisheries Assessment Unit and District staff, and reports identifying significant natural areas along the Niagara Escarpment.

- Limitations associated with certain of these data sources include: the designation of boundaries that are only approximate; the transfer of area boundaries from a generalized small scale map to our mapping scale of 1:50,000; the dynamic state of biological communities; and the varying level of effort expended in conducting the original studies -- in some cases, field work was limited to reconnaissance-type visits.

- Airphotos used to identify larger forested areas were taken in 1983 at a scale of 1:30,000. They may not always be an accurate depiction of woodlot boundaries in 1984 but can be verified simply by brief reconnaissance visits in later stages.

IDENTIFICATION OF POTENTIAL SITES

- Information plotted for the constraint mapping stage was used and the significance of the data base was confirmed through discussions with scientific and planning experts.

- The existing data sources contained information on some potential sites and none for others.

- Roadside field observations allowed some vegetation boundary refinement and checking of factors.

IDENTIFICATION OF CANDIDATE SITES

- A limited data base was available to interpret significance of streams crossed by access roads; Gartner Lee did not have extensive information on water taking, livestock watering and other local uses. This preliminary analysis was based primarily on interpreted flow permanence and fishery use.

MAIN FINDINGS

IDENTIFICATION OF SITE AREAS

- Two biology factors were selected for the identification of site areas. These are:

  (i) Significant Environmental Units (SEUs); and

  (ii) non-SEU Woodlots greater than 20 ha (50 acres) in size.

  Descriptions of these factors are provided in Appendix V.

- SEUs include Environmentally Significant (or Sensitive) Areas (ESAs), Areas of Natural and Scientific Interest (ANSIs), and Areas of Important Biological Resources (AIBRs), all of which have been designated in published reports.

- We have defined non-SEU Woodlots greater than 20 ha in size as those forested areas which have not been

designated as ESAs, ANSIs, or AIBRs; they were designated as woodlots which may, based on size alone, have a greater likelihood of supporting a variety of forest plant and animal species than do smaller patches of trees.

- SEUs are ranked as having higher environmental significance than non-SEU Woodlots >20 ha since there is a higher degree of confidence in their designation and since there is a greater likelihood of impacting an important environmental resource if facility development occurs on an SEU.

- The occurrence of SEUs and non-SEU Woodlots >20 ha is relatively sparse in the Halton/Peel candidate areas and common in the eastern Niagara Peninsula candidate areas. Information on distribution of these two factors may be found on pages 20 to 29 of the report, Appendix I and in maps in the map portfolio.

- SEUs and non-SEU Woodlots >20 ha considered together create a pattern of undeveloped areas among mainly agricultural and residential lands.

- The impact of developing on or adjacent to SEUs and non-SEU Woodlots will vary according to the special attributes of, and environmental function served by them and the amount of resource displaced.

IDENTIFICATION OF POTENTIAL SITES

- The SEU and non-SEU Woodlot >20 ha factors were retained for use in the identification of potential sites. In later steps of this screening exercise, three factors were added -- "other vegetation", "aquatic habitat" and "terrestrial wildlife habitat".

- Contact with experts regarding significance of certain woody plant species confirmed justification for designation of SEUs.

- At this point, the site selection team used SEUs along with larger forested lands for the definition of site boundaries (see Site Selection Report).

IDENTIFICATION OF CANDIDATE SITES

- SEUs, non-SEU Woodlots >20 ha, other vegetation, aquatic habitat and wildlife habitat were factors applied again during the identification of candidate sites. "Other vegetation" was refined to indicate distribution of cover types within site acquisition boundaries and adjacent lands.

- Of the 16 sites compared during initial comparative evaluation, LF-10W, LF-1E, LF-3E and P1-13N had major biological constraints associated with them. The presence of SEUs justified the "major constraint" rating for these sites but proper site design and management may afford protection to biological resources present. For example, the SEU associated with PI-13N is the Etobicoke Creek Valley which touches the extreme southeastern margin of the study area. Development of facilities on such a site would be away from the creek valley, on the upland portion of the site.

- "Stream crossings" was the biology factor used in comparing alternative access routes to the various sites.

- Results of the access route assessment should be considered as a preliminary indication of conditions found along

roads leading to sites. Many access routes have been assigned major biological constraint status because one or more important fish migration routes are crossed.

- The relative level of constraint associated with the seventeen siting options was determined for biological factors. Site conditions were determined to be of most significance in rating constraint. Major access route constraints were highlighted but did not influence grouping of siting options.

CONCLUSIONS AND RECOMMENDATIONS

- The use of secondary source data augmented by limited field study of biological resources has proven effective in contributing to the third phase of the site selection process. Potential sites identified generally met goals and objectives of the site selection process from a biological perspective.

- During public consultation, support for the protection of SEUs and, to a lesser extent, non-SEU Woodlots greater than 20 ha, was expressed; hence these resources should be given special consideration in site selection, design and management.

- The presence of an SEU or non-SEU Woodlot of greater than 20 ha within the acquisition area and/or buffer zone lands of a potential site need not necessarily be reason for exclusion of the site from further consideration. Provided that site design and management is sensitive to these factors, they could afford a site benefit through provision of natural screening. Proper management and design strategies could ensure the long-term protection of the biological resource.

- It is recommended that biological resource factors be utilized during Phase 4 of the site selection process, as a means of avoiding impacts on the natural environment. It is further recommended that existing local scale information be retrieved by means of contacts and discussions with local experts, government personnel and interest groups, during Phase 4A (detailed comparative evaluation). Existing information should be confirmed by visits to candidate sites and adjacent lands during Phase 4A.

INTRODUCTION

BACKGROUND

In May 1983, the Phase 3 Interim Report of the Ontario Waste Management Corporation (OWMC) indicated that 19 candidate areas in the Golden Horseshoe had been identified for further evaluation in the process of selecting a site or sites for facilities to treat and dispose of special wastes. In January 1984, one additional candidate area was identified east of Brampton as a result of an intensive hydrogeologic and geologic search in "Area A-1" - the lands stretching easterly from Brampton to Oshawa (Gartner Lee Associates Limited, 1983).

To further narrow the candidate areas down to smaller, more discrete candidate sites, the distribution of a number of biophysical, land use, social, planning and engineering factors was mapped within the candidate areas. More detailed objectives and factors were selected within each goal which OWMC set for the site selection process. The three basic site selection goals were:

(i) to minimize risk to human health;

(ii) to minimize environmental impact; and

(iii) to minimize financial cost to OWMC.

The application of biology factors in the site selection process in part fulfills the basic goal of minimizing environmental impacts; also, to a lesser extent, biology factors could relate to the minimization of risk to human health under certain circumstances. OWMC retained Gartner Lee Associates Ltd. to address biological considerations during Phase 3B.

This report identifies the biology factors which are considered important in achieving OWMC's site selection goals and objectives and which were applied during various stages of the site identification process (Figure 1). It presents the distribution of biology factors on a regional scale for the identification of site areas, and describes the biological information made available to the site selection team for the definition and comparison of potential sites.

For an understanding of the role of other factors in the site selection process, the reader is referred to individual technical reports on geology, planning, etc. and to the report which describes the overall site selection process (Dillon, 1984).

PURPOSE AND SCOPE

The purpose of this study was three-fold:

(i) to identify obvious biology factors which would influence the various stages of the site selection process, keeping in mind OWMC's site selection goals and objectives;

(ii) to explain the rationale and approach used in the identification of biology factors in the various stages associated with the selection of candidate sites;

(iii) to evaluate the significance of such factors to aid in defining smaller units within the candidate areas and site areas and in defining boundaries of and in comparing potential sites.

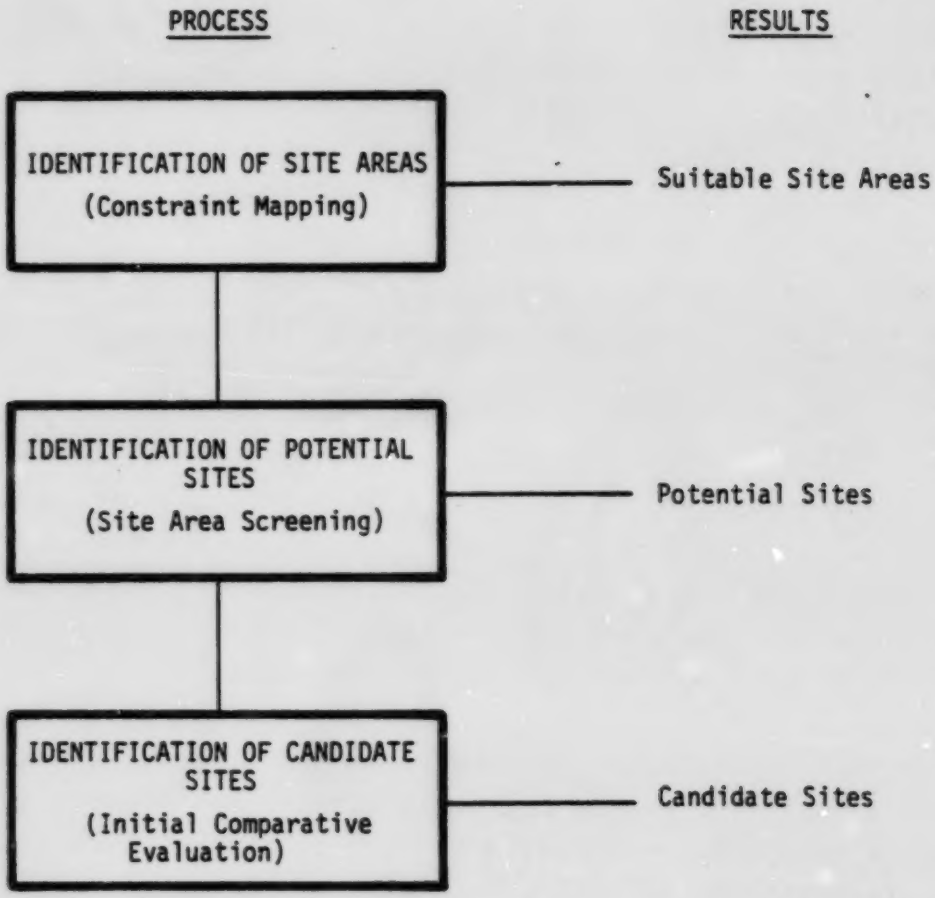

FIGURE 1: SITE IDENTIFICATION PROCESS - PHASE 3B

The study evolved from regional in scope in its early stages, to local in scope in the identification of potential sites. Since property access was not intended at this stage, the study relied heavily on published information; however, this was augmented by brief field visits and by contact with agencies and experts. Information generated at one stage of the process was often used in successive stages.

The geographic scope of the biological study changed as the process advanced. In the early constraint mapping stages, the study area was expanded at least 1 km beyond the edges of the candidate area boundaries and related to the adjacent systems. In later stages of identification of potential sites, site boundaries were determined by the consultant team and biological factors were assessed within and adjacent to proposed acquisition boundaries.

In a few cases, published information (eg. ANSI and ESA reports) addressed earth science features and for convenience, such information is included here.

Confidence in the data base was determined indirectly through discussions with appropriate authors and experts and through a reconnaissance windshield survey of the study area. Direct verification of information will not be possible until the site-specific study phase is completed.

RATIONALE/GOALS AND OBJECTIVES

The rationale for applying biology factors relates to OWMC goals and objectives which are basic to the entire site selection process. As well, application of biological factors relates to the policies and guidelines of various levels of government.

Based on OWMC's policies and priorities together with public input, the three site selection goals have been ranked in the following order of importance.

(i) Minimize risk to human health.

(ii) Minimize environmental impacts.

(iii) Minimize financial costs to OWMC.

Biological considerations were part of objectives relating to the minimization of risk to human health and the minimization of environmental impacts goals.

Several objectives which addressed environmental "pathways" as a means of minimizing risk to human health have biological components. One objective involved facility siting to minimize potential contamination of food chains. This would have a biological component if natural foods chains are considered. At the present time we have no information on human use of wild foods but this will be considered during Phase 4, when detailed site studies are conducted.

Another objective seeks to place facility components in settings serviced by access routes which have low potential

for impact on terrestrial and aquatic ecosystems in the event of spills. The stream crossing factor, which was applied during the identification of candidate sites, assists in attaining this objective by identifying sensitive biological water uses downstream of road crossings.

Biological considerations were most prevalent in objectives relating to the goal to select sites which minimize environmental impact. Four objectives addressed by biology factors during Phase 3 were designed to avoid destruction and minimize disruption of: significant natural ecosystems, significant vegetation and wildlife populations, rare or uncommon species of plant and animal life, and significant landforms and other physical features.

Often, biological resources are limited in their distribution in the study area owing to their displacement by agricultural and urban development over the years. As a result, some terrestrial and aquatic habitats previously common in the province have become relatively scarce.

Certain agencies such as the Ministry of Natural Resources, Conservation Authorities and Regional Municipalities recognize the importance of the biological resources of the Province. While such resources are not always protected by law or designated in Official Plans, they are highlighted or "flagged" as important in provincial or regional documents. Often their distribution coincides with terrain features such as hazard lands and floodplains which may be designated in Official Plans.

If development occurs on or displaces a biological resource documented as important, there is a likelihood of creating a significant environmental impact. Furthermore, environmental

planning agencies in the Province have highlighted many of the more important biological resources in the interests of their protection; hence, an effort should be made to avoid them or to mitigate impacts on them through responsible design and management.

In many cases, biological resources could provide positive attributes in lands surrounding the facilities (buffer zone lands) provided that their value and sensitivity are recognized and mitigation efforts are made to avoid and protect them. Biological resource mapping can provide early insight into the distribution of major vegetation units in the vicinity of potential sites. Such biological resources in buffer zone lands can provide natural screening of the site and at the same time, possible buffer zone land use controls can afford a management and protection mechanism for such wooded areas.

Based on this rationale and upon OWMC goals and objectives, biology factors were selected as described in more detail in later sections of the report. Factors arose from the site selection objectives and factor selection was influenced by the data which were available at each stage of the process. As the scale of study became more detailed and the range of information broader, the number of biology factors increased. Seven site-related factors and a single access route factor were used during Phase 3B. The factors applied at the various stages of the site selection process are provided in Table 1.

TABLE 1: BIOLOGICAL FACTORS USED DURING EACH STAGE OF PHASE 3B

STAGE OF PROCESS	FACTORS
Identification of Site Areas	• Significant Environmental Units (SEUs) • Non-SEU Woodlots >20 ha in size • Other Lands
Identification of Potential Sites	
• Step 1	• SEUs • Non-SEU Woodlots >20 ha in size • Other Lands
• Step 2	• SEUs • Non-SEU Woodlots >20 ha in size • Other Vegetation • Aquatic Habitat • Terrestrial Wildlife Habitat
Identification of Candidate Sites	
• Site Related	• SEUs • Non-SEU Woodlots >20 ha in size • Other Vegetation • Aquatic Habitat • Terrestrial Wildlife Habitat • Local Setting
• Access Roads	• Stream Crossings

LIMITATIONS

The study contains a number of minor limitations. First, it is based mainly on published information and limited field work. Some of the reports were published as many as eight years ago and in that time, boundaries of areas containing significant biological resources may have changed and the status of plant and/or animal species may also have changed as distribution ranges expand or species become less common. Contact with agencies who sponsored the original studies often revealed a lack of awareness of present-day status of uncommon species within significant areas.

Second, it was difficult to accurately transpose boundaries of significant environmental areas shown in the Niagara Region Official Plan since the scale of mapping in that document was so small (e.g. Lyons Creek near candidate site LF-1E). For certain Areas of Natural and Scientific Interest (ANSIs) had been identified by the Ministry of Natural Resources, precise boundaries have not been reported in recent documents. The location of each of these ANSIs is represented by a dot.

In the case of many local planning documents, biological resource information may be included under such designations as "open space", "green belts" and "environmental policy areas". These have not been addressed here since these designations are based on very limited original field study. Biological features of concern will be addressed during Phase 4 if they exist in such areas.

Fourthly, most studies from which we have drawn information are often restricted by time and level of effort, and thus seek to assess whether predetermined areas support populations of

uncommon plants and animals. It is probable that within a given region, areas which may have been designated as important, if they had been studied, were overlooked. At the same time, areas that have been designated may harbour additional populations of uncommon species which were overlooked during the original field visits.

Next, the study does not address biological resources associated with possible treated liquid effluent outfall locations. Such information can be collected at later stages when decisions are made on such a treatment option and possible locations.

Finally, it should be recognized that it will be possible to discover important biological resources at later site-specific stages of the facility development process. Furthermore, as the results of further field study improves our understanding of, for example, the distribution of certain plants and animals, the status of documented biological resources may have to be re-evaluated.

Natural changes in species distribution may also lead to the need for status re-assessment. This may arise when, for example, uncommon bird species no longer breed in an area designated as an Environmentally Significant Area (ESA). Clearing of forested areas or draining of wetlands by property owners may change boundaries and eliminate habitat or species which previously justified ESA designation.

These limitations are presented to properly clarify the status of the data base. The application of biology factors as described will serve to avoid or "flag" most of the significant biological features. Incorporation of biological factors at this stage of the site selection process will aid in avoiding

or minimizing impacts on most important biological resources. Further more detailed study in later stages will provide another opportunity to assess possible biological features which may be found on candidate sites.

Application of factor data was consistent with recognized limitations.

IDENTIFICATION OF SITE AREAS

METHODS

GOALS AND OBJECTIVES

No site-specific studies were completed in Phase 3B, which relied on secondary information sources. Much of the information which we used had been assembled during our Phase 1 work. This information along with other available data were reviewed and interpreted in light of OWMC goals and objectives and government policies and guidelines.

The OWMC site selection goal which related most directly to this Phase 3 Biology study was to select a site which would "...minimize environmental impacts...".

Within this goal, a number of objectives related to biology factors were developed as follows:

- to avoid destruction and minimize disruption of significant natural ecosystems,
- to avoid destruction and minimize disruption of significant vegetation or wildlife populations,
- to avoid destruction and minimize disruption of rare or uncommon species of plants and animals.

As well, another objective which fulfills the "minimize environmental impact" goal is included in this report -

- to avoid destruction and minimize disruption to significant landforms and other physical features.

The other goal that could in part be achieved by this study was:

"...to minimize risk to human health..."

A single biological resource-related objective was developed to help achieve this goal.

- to site facility components to minimize potential contamination of human food chains in the environment.

In addition to the goals and objectives of OWMC, many environmental management and planning agencies highlight or "flag" the more important biological resources in the interests of their protection. This policy was regarded as important in guiding our approach to site selection.

INFORMATION SOURCES

With these goals and objectives in mind, pertinent documentation which addressed biological resources in the 20 candidate areas was assembled and reviewed. Documentation which we relied upon most heavily was mainly found in the following three categories:

(i) environmentally significant or sensitive areas (ESA) studies;

(ii) reports prepared by the Ministry of Natural Resources, of which there were four types;

- District Land Use Guideline documents;
- reports which map and describe Areas of Natural and Scientific Interest (ANSIs);

- a fish migratory route map for southern Ontario with updated information provided by Fisheries Assessment Unit staff, and staff at District Offices for the lower reaches of some streams draining the Golden Horseshoe;
- reports which identify significant natural areas along the Niagara Escarpment;

(iii) Official Plans of the Regional Municipalities of Halton, Hamilton-Wentworth, Haldimand-Norfolk, and Niagara.

Meetings were held with the Conservation Authorities and MNR to determine the current status of ESAs and ANSIs, respectively. Ontario Hydro was contacted regarding their computerized environmental data base.

In addition to the review of published material, 1983 air photos were interpreted to locate forested areas which had not been accorded special significance in the documented material. A minimum of 20 ha (50 acre) size cut-off was applied because it has been found that woodlots greater than this size support a large variety of forest bird species (Galli et al. 1976, p.359). We concluded from this that such woodlots would be expected to provide conditions suitable for a variety of forest plant and animal species. Such woodlots could also afford potential for forest recreation experiences and economically important forest resources.

Finally, a brief reconnaissance survey by car provided an opportunity to develop a relative impression of biological conditions in candidate areas north of Lake Ontario and in the Niagara Peninsula.

DATA ANALYSIS

Data analysis was completed by accomplishing two major tasks:

- identify biology factors; and
- plot and assess the distribution of biology factors across the 20 candidate areas.

The identification of biology factors to fulfill goals and objectives was determined from the information base described in this chapter and from application of knowledge of habitat requirements of plants and animals. Basically, factors identified areas which serve basic environmental functions and/or which exhibit special attributes. They include areas which have an inherent biological and/or earth science significance and/or sensitivity, a value for scientific research, education or natural heritage appreciation, and areas which provide important habitat for rare plants, and certain fish and wildlife species.

The distribution of biology factors within the candidate areas was plotted at 1:50,000 scale using the National Topographic Map Series as a base. Those which occur adjacent to (i.e. within 1 km of the candidate area boundary) the candidate areas are plotted as well. These have been presented because the biological resources in one area often relate to others adjacent to them. Wildlife, for example, may be sensitive to certain land uses on adjacent lands, or may rely on adjacent lands for feeding purposes or as migration/movement corridors.

Maps showing the distribution of biology factors are found in the separate Phase 3B Map Portfolio. A map set at the 1:50,000 scale has been filed with OWMC. Appendix 1 contains a synopsis of the biology factors which occur in or

adjacent to the candidate areas. These "Candidate Area Accounts" are organized according to map sheet.

Finally, estimates were made of the amount and percentage of candidate areas occupied by the biology factors used during this stage of the process. These estimates provide an indication of the potential influence on the site selection process by the biology factors.

BIOLOGICAL FACTORS

SIGNIFICANT ENVIRONMENTAL UNITS (SEUs)

Information contained in ESA studies, MNR documents and Official Plans for Regional Municipalities was assessed. Documented information which related to OWMC goals and objectives (see 'METHODS') is identified as follows:

- Environmentally Significant (or Sensitive) Areas (ESAs)
  These are "natural landscapes including those lands and or waters of inherent biological sensitivity, such as those areas containing aquifer recharges, headwaters, unusual plants, wildlife or landforms, breeding or overwintering habitats, vital ecological functions, rare or endangered species or other combinations of habitat and landform which could be valuable for scientific research or conservation education" (Eagles and Adindu, 1978, p.24-25).

- Areas of Natural and Scientific Interest (ANSIs)
  These are "areas of land and water containing natural landscapes or features that have values related to protection, natural heritage appreciation, scientific study or education" (Ontario Ministry of Natural Resources,

1983c, p.51), and which vary in level of significance: provincial and regional earth and life science ANSIs. Also considered were local earth science ANSIs and other life science ANSIs of documented significance.

- Areas of Important Biological Resources (AIBRs)
  Comprising wildlife and waterfowl habitat, AIBRs include wetlands, valley lands, woodlots, shoreline areas, deer wintering areas, waterfowl staging areas, areas containing diverse plant and animal species, and large continuous areas which provide wildlife travel corridors (Ontario Ministry of Natural Resources, 1983b, c, d). Inland lakes which support a recreational fishery, streams maintaining a warm water fishery, streams supporting significant runs of migratory fish, and streams supporting a significant bait fishery are considered AIBRs from a fisheries point of view (Ontario Ministry of Natural Resources, 1983b, c, d).

Such biological resource data sources for which documentation is available were consolidated under one heading - *Significant Environmental Units or SEUs*.

It should be explained that in the case of ESAs and ANSIs, physical resource areas regarded as significant are included in the data sources. In very few cases did such landform units identified in the literature fall within candidate areas. For this reason and since this report largely addresses the goal of "minimizing environmental impacts", these few *physical* units are presented in this report.

SEUs have been identified by government and other experts and have involved varying levels of field study. Study teams have a working knowledge of the study area and have accorded the SEU some environmental significance in relation to the biophysical characteristics prevalent in the particular area

of study. For this reason, we have confidence that development within SEUs would involve a high possibility of creating an environmental impact.

Therefore, we have identified "SEUs" as our first biological factor.

NON-SEU WOODLOTS

As discussed earlier, forested areas greater than 20 ha (50 acres) in size are likely to support a variety of forest wildlife and afford potential to provide recreational experiences as well as economically important forest resources. Some of these larger woodlots have been studied and identified as SEUs; however, many have not. It is these *"non-SEU woodlots greater than 20 ha (50 acres)"* that, while *not documented,* have a higher likelihood of serving an important environmental function or of supporting some unusual biological attribute than smaller unstudied woodlots. Because the non-SEU woodlots greater than 20 ha have not received field study or such study has not been documented in our information sources, we can only speculate on the importance of the woodlots.

While it is possible that these larger forested units may not be biologically significant, it is likely that they afford at a minimum, good wildlife habitat. Site-specific study may reveal the presence of rare or uncommon species or an important environmental function.

For these reasons we have identified "non-SEU woodlots greater than 20 ha (50 acres)" as our second biological factor.

The remaining lands within the 20 candidate areas are occupied by farms, utility corridors and residential or industrial lands. As well, woodlots of less than 20 hectares that do not

fall within the SEU category could be expected. It is acknowledged that some of these woodlots may contain some special feature or provide an important environmental function. However, the likelihood of creating an impact on important biological resources is considered to be less on other lands than on SEUs and non-SEU woodlots >20 ha in size.

Such areas where there is a lower likelihood of environmental impact on important biological resources are identified by our final factor -- "Other Lands".

This factor provided for complete mapping coverage of lands within the candidate areas, but was not used as a site selection factor.

FACTOR RANKING

To aid in determining which factors could best be used to reduce candidate areas to smaller site areas, the two biology factors were ranked according to their relative importance.

SEUs were assigned a higher ranking than non-SEU woodlots >20 ha owing to:

- the higher level of confidence associated with the data source;
- the high possibility of destroying a significant environmental feature if the SEU were displaced;
- the fact that environmental management and planning agencies have seen fit to highlight SEUs in the interests of their protection.

Non-SEU woodlots greater than 20 ha were not documented or assigned special significance in our data sources. While there may be a greater likelihood that they serve an important environmental function or exhibit some special attributes than smaller woodlots, we have no results of field study to confirm such assumptions. Until such field study is completed, non-SEU woodlots >20 ha have been assigned a lower factor ranking than SEUs.

Participants at a public workshop in October/November 1983 felt that both SEUs and non-SEU woodlots greater than 20 ha in size should be considered to be of significance.

DISTRIBUTION OF SEUs AND NON-SEU WOODLOTS

The distribution of the biology factors in and adjacent to the twenty candidate areas is portrayed on Maps G-B1, G-B2, G-B3 and G-B4 in the Map Portfolio. SEUs have been identified on the maps by number and are listed in Table 2 according to candidate area. Also Table 2 describes the type of SEU (whether an ESA, ANSI or AIBR) and the information source. SEUs which are designated by regional official plans are noted by an asterisk in Table 2.

Environmentally sensitive areas (ESAs) shown in the Niagara Region official planning documents were not included on the biological resources maps. This is the case because the approach taken to identifying these ESAs differed from that used in other studies. These were addressed in a "Policy Plan" which indicates that the boundaries of these SEUs will require more precise definition in the future.

An asterisk appears in Table 2 and the Policy Plan

TABLE

Significant Environmental Units Associated With Candidate Areas

CANDIDATE AREA	SIGNIFICANT ENVIRONMENTAL UNIT	NAME	TYPES OF SIGNIFICANT ENVIRONMENTAL UNIT			INFORMATION SOURCE [1]
			Environmentally Significant (Sensitive) Areas (ESAs)	Areas of Natural and Scientific Interest (ANSIs)	Areas of Important Biological Resources (AIBRs)	
1	1-1	Bronte Creek			x	11, 14
	1-2	Crawford Lake - Rattlesnake Point Escarpment Woods - Campbellville Outwash Alluvial Fan	x	x	x	18, 13, 14
	1-3	Lowville Bronte Creek Valley		x		13
2	2-1	Halton Till		x		13
	2-2	Bronte Creek Valley	x		x	18, 14
3	nil					
4	4-1	Credit River			x	15
	4-2	Credit River Floodplain at Reed Dam	x	x		5, 13
	4-3	Sandford's Pond	x		x	5, 15
	4-4	Meadowvale Station Woods	x	x		5, 13
	4-5	Unnamed			x	15
	4-6	Credit River near Streetsville		x		15, 13
	4-7	C.P.R. Bridge Section		x		15, 13
	4-8	Georgian Bay Formation		x		13
5	5-1	Sixteen Mile Creek			x	11
	5-2	Oakville (Sixteen Mile) Creek Valley	x	x	x	18, 14, 13
6	6-1	South Duff's Corner Forest		x		13, 10
	6-2	Fort Erie Moraine (west)		x		13

TABLE 2: (cont'd)

Significant Environmental Units Associated With Candidate Areas

CANDIDATE AREA	SIGNIFICANT ENVIRONMENTAL UNIT	NAME	TYPES OF SIGNIFICANT ENVIRONMENTAL UNIT			INFORMATION SOURCE 1
			Environmentally Significant (sensitive) Areas (ESAs)	Areas of Natural and Scientific Interest (ANSIs)	Areas of Important Biological Resources (AIBRs)	
7	7-1	Green's Road Woods	x	x		3, 13
	7-2	North Caledonia Stream Basin		x		13, 10
	7-3	Moores Creek		x		13, 9
	7-4	East Caledonia Forest		x		13, 10
	7-5	Wilson's Sink Holes		x		13, 10
	7-6	McKenzie Creek Slope Forest		x		13, 10
	7-7	North York Alluvial Islands		x		13, 10
	7-8	Oneida Woodlot	x*	x		7, 13, 17
	7-9	McKenzie Creek		x		13, 10
	7-10	Grand River			x	11, 16
	7-11	West Mount Healy Forest		x		13, 10
	7-12	Hagersville Raised Beaches		x		13, 16
	7-13	Springvale Cedar Swamp	x*	x		17, 9
	7-14	La Fortune Conservation Area		x		13, 10
	7-15	Grand River Valley		x	x	9,10, 13, 16
	7-16	Clanbrassil Raised Beaches	x*	x		7, 13, 16, 17
	7-17	Big Range	(x)			3
8	8-1	Lake Niapenco		x	x	13, 14
	8-2	Welland River Meander		x		13, 10
	8-3	Welland River Meander		x		13, 10
	8-4	Sinclairville Lowland Forests	x*	x		4,20, 10, 13
	8-5	Inverary Woods	x	x		1, 13
	8-6	Moore's Creek	x	x		1, 13
	8-7	McCready's Bush	x	x		1, 13
	8-8	Vaughan Forest	x	x		1, 13
	8-9	Caistor - Canborough Slough Forest	x	x		1, 10, 13
	8-10	West Canboro Stream Basin		x		13, 10

TABLE 2 (cont'd)

Significant Environmental Units Associated With Candidate Areas

CANDIDATE AREA	SIGNIFICANT ENVIRONMENTAL UNIT	NAME	TYPES OF SIGNIFICANT ENVIRONMENTAL UNIT			INFORMATION SOURCE[1]
			Environmentally Significant (Sensitive) Areas (ESAs)	Areas of Natural and Scientific Interest (ANSIs)	Areas of Important Biological Resources (AIBRs)	
8 (cont'd)	8-11	North Moulton Station Forest		x		13, 10
	8-12	Chippawa Creek Conservation and Wildlife Management Area	x	x		1, 13
	8-13	Hedley Forest		x		13, 10
	8-14	Attercliffe Station Slough Forest		x		13
9	9-1	Hannon Floodplain Forests	x	x		4, 13
	9-2	Caistor Centre East	x	x		1, 13
	9-3	Hafeman's Bush	x			1
	9-4	Twenty Mile Creek Floodplain Forest and Meadows	x	x		4, 13
	9-5	Woodburn Floodplain	x*			4, 20
	9-6	Twenty Mile Creek	x*	x		1, 21, 13
	9-7	Brouwer Bush	x			1
	9-8	Smithville Cave		x		13
10	10-1	Tweedside Forest	x			4
	10-2	Stewart's Wood	x			1
	10-3	Spring Creek Bush	x			1
	10-4	Moore Woodlot	x			1
	10-5	West Cressie Forest		x		13, 10
	10-6	Suttell Forest	x			1
	10-7	Spring Creek Rockland Forest		x		13, 10
	10-8	Leyburn Bush	x	x		1, 13
	10-9	Silverdale Twenty Mile Creek		x		13, 10
11	11-1	Wainfleet Bush	x			1
12	12-1	Wainfleet Bog	x*	x	x	1, 21,13,16
	12-2	Chambers Corners Clay Plain		x		13, 9

TABLE 2 (cont'd)

Significant Environmental Units Associated With Candidate Areas

CANDIDATE AREA	SIGNIFICANT ENVIRONMENTAL UNIT	NAME	TYPES OF SIGNIFICANT ENVIRONMENTAL UNIT			INFORMATION SOURCE 1
			Environmentally Significant (sensitive) Areas (ESAs)	Areas of Natural and Scientific Interest (ANSIs)	Areas of Important Biological Resources (AIBRs)	
13	13-1	Polloway Bush	x			1
	13-2	Cyanamid Corners	x			1
	13-3	Ramsey Road Woodlot	x			1
	13-4	Marineland Woodlot	x			1
	13-5	Welland River	x*		x	16
	13-6	Lyons Creek	x*		x	16
	13-7	Usshers Creek			x	16
	13-8	Willoughby Marsh	x*	x	x	1,21, 13, 16
	13-9	Usshers Creek Mouth Forest / River Mouth		x	x	13, 16, 10
	13-10	Boyer's Creek Bush	x			1,
	13-11	Waverly Woodlot	x			1
	13-12	Summer Street Woodlot	x			1
	13-13	Beaver Creek	x			1
	13-14	Fox Street Woodlot	x	x		1, 13, 21
	13-15	Port Robinson Duck Ponds	x	x		1, 13
	13-16	Dufferin Islands/Victoria Park/Niagara Gorge	x	x		1, 13
	13-17	Upper Niagara River			x	16
	13-18	Willoughby Drive Woodlot	x			1
	13-19	Boyers Creek Mouth		x	x	13, 16, 10
	13-20	Mouth of Black Creek	x*		x	21, 16
	13-21	Ridgemount Road Woodlot	x			1
	13-22	Lower Miller Creek Forest / River Mouth		x	x	13, 16, 10
	13-23	Miller Creek Woodlot	x	x		1, 13
14	14-1	Credit River at Meadowvale	x	x		5, 13
15	nil					

TABLE 2 (cont'd)

Significant Environmental Units Associated With Candidate Areas

CANDIDATE AREA	SIGNIFICANT ENVIRONMENTAL UNIT	NAME	TYPES OF SIGNIFICANT ENVIRONMENTAL UNIT			INFORMATION SOURCE [1]
			Environmentally Significant (Sensitive) Areas (ESAs)	Areas of Natural and Scientific Interest (ANSIs)	Areas of Important Biological Resources (AIBRs)	
16	16-1	Lost Mile Woods	x	x		3, 13
	16-2	Carluke Woodlot		x		13, 10
	16-3	Station Woods	(x)			3
17	17-1	North Cayuga Slough Forest		x		13, 10
18	18-1	Caistor Bush	x	x		1, 13
	18-2	Garber's Grove	x	x		1, 13
	18-3	Hardy's Wood	x	x		1, 13
	18-4	Silverdale Bush	x	x		1, 13, 12
	18-5	Sucker Creek	x			1
	18-6	Pot's Woodlot	x			1
	18-7	Bismarck Bush	x	x		1, 13
	18-8	Davison's Bush	x	x		1, 13
	18-9	Comfort's Bush	x	x		1, 13
	18-10	Southwest Elcho Forest	x	x		1, 13, 10
	18-11	Welland River	x*		x	16
	18-12	Myers Woodlot	x			1
	18-13	Henderson Road Woodlots	x	x		1, 13
	18-14	Perry Road Woodlot	x	x		1, 13
	18-15	Skrubbeltranq Woodlot	x			1
	18-16	Elsie Road Woodlot	x	x		1, 13
	18-17	Jersey Woodlot	x			1
	18-18	Vachon Bush	x			1
	18-19	Petit Road Bush	x			1
	18-20	Fence-Line Woodlot	x			1
	18-21	Fletcher Woodlot	x			1
	18-22	South Pelham Hemlock Bush	x	x		1, 13
	18-23	Forks Creek Woods	x			1

TABLE 2 (cont'd)

Significant Environmental Units Associated With Candidate Areas

CANDIDATE AREA	SIGNIFICANT ENVIRONMENTAL UNIT	NAME	TYPES OF SIGNIFICANT ENVIRONMENTAL UNIT			INFORMATION SOURCE 1
			Environmentally Significant (sensitive) Areas (ESAs)	Areas of Natural and Scientific Interest (ANSIs)	Areas of Important Biological Resources (AIBRs)	
18 (cont'd)	18-24	Welland Airport Woodlot	x	x		1, 13
	18-25	Tunacliffe Road Woodlot	x			1
	18-26	Highland Woodlot	x	x		1, 13
	18-27	Farr's Road Woodlot	x			1
	18-28	Babion Road Woodlot	x			1
	18-29	Salina Formation		x		13
	18-30	Unnamed		x		13
	18-31	Unnamed		x		13
	18-32	Boye's Woodlot	x	x		1, 13
	18-33	Riverview Woodlot	x			1
	18-34	Bill's Bush	x			1
	18-35	Bunz Bush	x	x		13, 1
19	19-1	McKenny Road Woodlot	x			1
	19-2	Horse Track Woodlot	x			1
	19-3	Young Woodlot	x			1
	19-4	Lyons Creek Floodplain Wetland	x*	x	x	21, 13, 16
	19-5	Yokom Woodlot	x*	x		1, 21, 13
	19-6	Old Lincoln Street Woodlot	x*			21, 1
Claireville	nil					

[1] Numbers refer to reports listed in REFERENCES

* ESAs which have been incorporated in Official Plans of Regional Municipalities and approved by the Ministry of Municipal Affairs and Housing.

+ These areas were studied by Brady et al., (1980) however no ESA status was assigned

(x) These areas were considered marginal ESAs (boundaries are approximate)

(Document #21 in References) is cited for instances in which Region of Niagara ESAs overlap areas mapped by other agencies. Boundaries of SEUs on the biological resources map sections which cover Niagara Region are those of agencies other than Niagara Region.

Detailed accounts of many of the SEUs are available in the original documents and are ready for use for the identification of potential sites and candidate sites.

Non-SEU Woodlots greater than 20 ha are located on the map set but are not numbered or otherwise identified.

Candidate area accounts are presented in Appendix I. These generally describe the distribution of SEUs and non-SEU Woodlots in and adjacent to each of the candidate sites.

Table 3 indicates the approximate area of SEUs and non-SEU Woodlots >20 ha within each candidate area. It also notes the proportion of each candidate area occupied by significant biological resources. Within the 20 candidate areas, almost 16% of all land is occupied by SEUs and non-SEU Woodlots. SEUs occupy over 10% of the candidate areas, and non-SEU Woodlots, over 5%.

SEUs and non-SEU Woodlots considered together create a pattern of undeveloped areas among a mosaic of agricultural and residential land in the Golden Horseshoe. Forested land in parcels over 20 ha is particularly sparse in the Halton/ Peel area (see Map G-B1), which includes Candidate Areas 1-5, 14, 15 and the Claireville area. Here, approximately 5% of the land is occupied by biological resources of significance. SEUs account for <2% of the lands and non-SEU Woodlots, approximately 4%. The largest proportions of land occupied by SEUs

TABLE 3: APPROXIMATE AREA OF SEUs AND NON-SEU WOODLOTS WITHIN CANDIDATE AREAS

MAP SHEET	CANDIDATE	AREA	APPROXIMATE AREA ESTIMATES		
			SEUs	WOODLOTS	TOTAL
	NUMBER	APPROXIMATE SIZE (ha)	% of C.A.	% of C.A.	% of C.A.
North	Claire-ville	1030	0	7	7
North	1	790	<1	<1	1
	2	300	0	0	0
	3	480	0	13	13
	4	1020	0	0	0
	5	3620	3	4	7
	14	1060	0	0	0
	15	400	0	0	0
West	6	2780	<1	6	7
	7	12190	7	6	13
	16	5180	<1	4	5
	17	4540	<1	8	8
Central	8[2]	19860	16	8	24
	9[3]	7490	<1	7	8
	10[2]	3370	6	4	10
	11	550	10	4	14
	18[3]	31030	12	4	16
East	12[1]	560	12	4	16
	13	8780	17	6	23
	19	3850	31	2	33
TOTALS		108,880			

Note: Other sections of these candidate areas occur on:
1 Map G-B3
2 Map G-B2
3 Maps G-B2 and G-B4

and non-SEU Woodlots occurs in Candidate Areas 13 and 19, in the most easterly portion of the Niagara Peninsula (Map G-B4). About 24.4% of the East map sheet is covered by SEUs (20%) and non-SEU Woodlots (approximately 4%).

IDENTIFICATION OF SITE AREAS

Factors from various disciplines were reviewed and their potential role in reducing the large candidate areas to smaller site areas was assessed by the consultant team. A number of factors (see Dillon, 1984) were applied in an exclusionary role and 152 site areas which were free of the selected constraint factors were identified. No biological factors were applied in the identification of the 152 site areas.

In response to input from the public workshops regarding trade-offs and diversity of choice, OWMC staff and the consulting team considered relaxing all exclusionary agricultural factors except specialty crops to identify possible areas that were highly accessible or highly accessible with deep clay soils (Dillon, 1984).

After a review of the accessibility issue by the Dillon transportation consultant, it was identified that Candidate Areas 3 and 5, north of Lake Ontario, were the only instances of the deepest clay soils in the most accessible of the Candidate Areas (Category 1A levels). Areas of deep clay soils (Category 1A) south of Lake Ontario are present in the eastern portion of Candidate Area 18. Transportation access to this area has been identified as being only average to below average. However the 1B lands west of this 1A area (also Candidate Area 18) stretching from Wellandport to Binbrook were considered to have somewhat better access than the 1A portion in the Niagara Peninsula.

To assess the transportation issue in more detail, prior to dropping agricultural factors as exclusionary, an assessment of the transportation corridors to the western end of Candidate Area 18 was undertaken.

The biological factor applied to aid in the comparison of access routes was "stream crossings". This factor identified significant fisheries uses in streams crossed by the various access routes to aid in route comparison. It is described more fully in the Identification of Candidate Sites (Page 67) and Table V.5 of Appendix V. Results of the stream crossings review for access routes to Candidate Area 18 are provided in Table 4.

The results of the application of this biology factor and others are discussed in the Dillon Site Selection Technical Report, 1984. The alternative route assessment identified no transportation advantages that would warrant compromising the agricultural criteria. Hence, no additional site areas were identified by this exercise.

Table 4

STREAM CROSSINGS ALONG ACCESS ROUTES TO SITE AREAS IN CANDIDATE AREA 18

ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
	SENSITIVE USE KNOWN	NO SENSITIVE USE				
		PERMANENT	INTERMITTENT	TOTAL NUMBER		
1. - south on Highway 20 to Woodburn Road - south on Woodburn Road to Hamilton-Wentworth Regional Road 622 - west on Hamilton-Wentworth Regional Road 622		• west tributary of Stoney Creek • 20 Mile Creek	10	12	Lake Ontario, Confederation Beach north of QEW	Moderate
2. - south on Highway 20 to Woodburn Road - south on Woodburn Road to Hamilton-Wentworth Regional Road 622 - east on Hamilton-Wentworth Road 622 to Niagara Regional Road 65 - east on Niagara Regional Road 65		• west tributary of Stoney Creek • 20 Mile Creek	11	13	Lake Ontario, Confederation Beach north of QEW	Moderate
3. - south on Niagara Regional Road 12 to Highway 20 - east on Highway 20 to Regional Road 14, southwest on Regional Road 14	• 40 Mile Creek	• 20 Mile Creek	19	23	Also crosses North Creek and tributaries to Beaver Creek	Major
4. - south on Bartlett Ave. to Niagara Regional Road 81 - west on Niagara Regional Road 81 to Niagara Regional Road 14 - south on Niagara Regional Road 14/714 to Regional Road 73 - east on Niagara Regional Road 73 to Regional Road 14 - south on Regional Road 14 to Highway 20 - east on Highway 20 to Regional Road 14, to Regional Road 16, southern Regional Road 16		• 30 Mile Creek • 20 Mile Creek • North Creek	12	15	Also crosses Parkers and Spring Creeks	Moderate

Table 4

STREAM CROSSINGS ALONG ACCESS ROUTES TO SITE AREAS IN CANDIDATE AREA 18

ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
	SENSITIVE USE KNOWN	NO SENSITIVE USE				
		PERMANENT	INTERMITTENT	TOTAL NUMBER		
5. - south on Niagara Regional Road 18 to Niagara Regional Road 69 - west on Niagara Regional Road 69 to Highway 20 - south on Highway 20 to Bismarck		• Spring Creek • 20 Mile Creek • 16 Mile Creek	4	8	Also crosses Parkers Creek	Moderate
6. - south on Niagara Regional Road 24 to Highway 20 - west on Highway 20 to Bismarck	• 20 Mile Creek: warm water fishery and salmonids downstream	• 16 Mile Creek • 15 Mile Creek	17	20	Also crosses Sucker and Beaver Creeks	Major

IDENTIFICATION OF POTENTIAL SITES

The purpose of the potential site identification stage was to reduce the number and refine the boundaries of site areas through the application of additional factors designed to fulfill site selection goals and objectives.

There were two major steps to identification of potential sites (site screening) from the biological point of view. Step 1 involved use of biology constraint mapping data, along with input for other physical, planning, etc. factors, to reduce the number of site areas from 152 to 90. During Step 2, brief visits were made to site areas. These visits provided the opportunity to confirm SEU and woodlot boundaries and to make observations on the character of sites. These observations were used during the second step of this potential site identification stage to assist in boundary delineation and to allow application of additional factors.

METHODS

At the end of the identification of site areas (constraint mapping) 65 landfill/integrated (LF) and 87 physical/chemical treatment/incinerator (PI) site areas had been identified. These areas were subjected to a screening procedure described in the Phase 3 Site Selection Process report (Dillon, 1984).

As noted, there were two major steps in which biological data were used during site screening. In the constraint mapping exercise, biology factors had not been applied in an exclusionary manner. Although one factor (SEUs) represented environmental

features documented as significant, there were some doubts regarding the relative significance of the various SEUs.

For example, few SEUs were protected by public policy, i.e. through designation in municipal official plans. As well, the Ministry of Natural Resources assigns different levels of concern to provincial, regional and local Areas of Natural and Scientific Interest (ANSIs). While provincial ANSIs are of most concern, the Ministry has no official policy on ANSIs and leaves their protection to the discretion of the District Office.

One of the fundamental issues in question was the fact that many of the SEUs were designated partly or totally on the basis of the occurrence of trees and shrubs which are at the northern fringe of their distribution range. Many of these "Carolinian" species are on a list of rare vascular plants of Ontario (Argus and White, 1977). Since most of the Golden Horseshoe coincides with part of the range of Carolinian species in Ontario, it was not unusual to find Carolinian species in SEUs; in fact, the presence of such species often was the reason for SEU designation. This situation raises the question -- are these plants rare if they occur in several of the SEUs?

For these reasons, application of biological resource factors to reduce areas and define boundaries was delayed to the potential site identification stage to allow further review of these issues. Since the "Carolinian distribution" question was a major consideration in resolution of the issues, several botanical experts were contacted as site screening proceeded.

Following this review, it was concluded that SEUs where Carolinian species were reported, were indeed significant and that SEUs would be applied on a site-by-site and SEU-by-SEU basis to assist in boundary delineation during screening of site areas.

STEP 1

Significant Environmental Unit (SEU) is explained in the previous chapter and Appendix V describes it further. Since SEUs may contain rare species, significant ecosystems or populations of plants and animals or landforms, avoidance of these areas in choosing sites would assist in attaining the minimization of environmental impact goal.

We know where non-SEU woodlots greater than 20 ha in area are situated and that certain of these woodlots might also harbour significant species or perform important environmental functions. However, we could not confirm the significance of specific non-SEU woodlots or differentiate levels of significance or sensitivity among these woodlots. Thus, non-SEU woodlots greater than 20 ha in area were not used during Step 1 of screening. As in the previous stage,"other lands" did not function as a site selection factor.

Overlays (1:50,000 scale) created during constraint mapping were placed over site area maps to determine where SEUs occurred within or immediately adjacent to sites. The reasons for designation of each SEU were also reviewed during the overlay process. In instances where justification of SEU designation could be confirmed, boundaries of the site area were altered to remove the SEU lands. If the area of the site which remained was too small, the site area was excluded from further consideration.

A record of the site areas which were rejected because of SEUs is contained in Appendix II, and is discussed in the results of site area screening. Boundaries of site areas described in Appendix II are shown as thick solid lines on maps contained in Appendix F of Volume 2 - Identification of Potential Sites (Dillon, 1984).

Certain sites which had SEUs intruding into them were retained if the sites appeared to meet key objectives of the site selection process. This allowed for retention of a greater range of options or maintenance of choice -- a site selection principle (Ontario Waste Management Corporation, 1984a, p.45).

Another example of a situation where sites with an SEU present were retained is the instance in which small intrusions of SEUs occur around the fringes of a large site. Such sites were retained because it is probable that more detailed studies might show that facilities could be placed to avoid the SEUs or could be developed with minimal impact on the SEU.

On sites where only physical/chemical treatment plants and/or incinerators are proposed, the proportion of the site occupied by facility buildings will be small. As noted earlier, it may be possible to place facilities in such a way that SEUs or other wooded lands may be retained in the buffer zones of sites. Existing on-site vegetation retained in buffer lands could function as a visual screen for facilities.

STEP 2

As noted previously, certain factors were retained for analysis at each step, but because of the narrowing study area and incorporation of field visits to the study approach, certain additions were made to the factor list.

During Step 2, SEU and Non-SEU Woodlots >20 ha were retained as factors. The third category in the constraint mapping inventory -- Non-SEUs, cleared areas and small wooded areas -- termed "other lands" for convenience, gave rise to an *"other vegetation"*

factor. Since sites were visited, it was possible to determine the presence or absence of *"aquatic habitat"* and *"terrestrial wildlife habitat"* and these became additional factors. Factor sheets for Step 2 of the identification of potential sites are contained in Appendix V.

The titles of certain factors applied in Step 2 and during initial comparative evaluation differ slightly from those contained in the Phase 3 report appendix (Ontario Waste Management Corporation, 1984b). Terminology was changed to make factor titles consistent through Phase 3B. Neither data collected, interpretations made, nor the results of analyses have changed. Only the headings under which results are reported have been revised.

Brief roadside visits during the winter of 1983-1984 provided the opportunity to obtain information on the major types of vegetation cover present, the types of water bodies present and the potential existence of fish and wildlife habitat. Mapping was produced at a scale of 1:10,000 for the 90 sites visited.

Special forms were designed upon which to record observations and to note the number and subject of photographs taken.

Summary comments regarding each factor were tabulated. A subjective assessment was made of the level of constraint associated with each site. These assessments addressed the lands within site boundaries provided at the time of field visits.

Constraint was described in four levels ranging from "no" constraint rating (little or no forest cover or aquatic and terrestiral wildlife habitat) to a "major" constraint rating (presence of a designated SEU).

RESULTS

STEP 1

As described earlier, the occurrence of SEUs within site areas and the presence of adjacent SEUs was considered to represent a constraint when evaluating site areas. Table A5.4 in the Phase 3 appendix report (Ontario Waste Management Corporation, 1984b, p.104-143) indicates the range of factors which led to rejection of landfill and physical/chemical and incinerator site areas. In instances where SEU occurrence played a role in site rejection, an open circle appears under the Number 3 heading. The identification number which was assigned to the affected SEU during constraint mapping is indicated in the "comments" column. Lands occupied by an SEU were generally removed from the site. This often resulted in reducing the size of the site area to such an extent that it was no longer large enough to accommodate the facility component(s) proposed.

Appendix II in the present report provides more detailed information on the characteristics of each SEU which occurred within or immediately adjacent to a rejected site area. The contents of this appendix should be reviewed for definitive information on the SEUs involved in screening out specific site areas. The environmental functions performed by the sites and special attributes present are described. Most often the special attributes consisted of the presence of more than one species of tree or shrub which are considered rare in Ontario. Since all of these findings are based on existing reports, the source of the information is noted, along with the report page on which the site account begins.

STEP 2

Field observations were made at 90 proposed facility locations, after the site screening exercise was completed. Although most observations were hampered by their brevity and the season, and were limited by the necessity to stay on road allowances, an adequate impression of some biology factors was obtained.

An example of the results obtained from the field work is included here for site LF-4W. Tables 5 and 6 contain the field observations, a list and description of photographs taken and a summary of biology observations. Figure G-B5 illustrates observation and photograph points, as well as the distribution of SEUs and non-SEU woodlots greater than 20 ha on and adjacent to each site area.

Field data forms, summary sheets, maps and site photographs for all sites visited are on file with OWMC.

The "conclusions" portion of the summary form contains comments on:

- any apparent biological constraints associated with the site,
- the presence of SEUs on or adjacent to the site,
- the accuracy of vegetation unit boundaries on the 1:10,000 map base.

Copies of all completed field forms, maps and photos were provided to the site selection team.

The presence of SEUs and larger non-SEU woodlots on site maps was considered during alignment of site boundaries.

Table 5

Field Observation Sheet - Biological Stations

Gartner Lee Associates Limited

Page 1 of 1

Site Area LF-4W **Date** Dec. 6, 1983

Observer C. Hughes

Station 1 (Roll 1 ; Photo 11) E. across fields towards woodlot

Primarily cultivated fields; very sparse, weedy hedgerows; woodlot - mixed White pine and deciduous, fairly dense underbrush; stand height 12-15 m. Sparse stand

Station 2 (Roll 1 ; Photo 12) S.E. across swale

Probably intermittent stream, very turbid (drains directly from newly cultivated field): approx. 4 m across flow area, flooded on either side; no aquatic potential, no trees or shrubs, just weeds

Station 3 (Roll - ; Photo -)

Insignificant patch of Hard maple on hill, Ironwood, Willow in low swale not large enough to support much wildlife; surrounded by abandoned pasture land

Station 4 (Roll 1 ; Photo 13) N. across fields towards woods

Farm woodlot - Hard maple - odd White pine - good fairly even aged stand, 19 m + height surrounded by cultivated land

Station 5 (Roll 1 ; Photo 14) S.E. over new white pine plantation

Immature 5-6 yr old white pine plantation (planted in abandoned pasture) doing fairly well against lots of grassland competition

Station 6 (Roll 1 ; Photo 15)

Beech - Maple woodlot with some maple, short 10 m upland forest, good distribution of dia. classes, many damaged and deformed trees, evidence of logging in last 20 years or so, likely a good squirrel population, plentiful beech regeneration.

Station 7 (Roll ____ ; Photo ____)

Station 8 (Roll ____ ; Photo ____)

Station 9 (Roll ____ ; Photo ____)

Station 10 (Roll ____ ; Photo ____)

Comments

Table 6

Field Observation Summary - Biology

Gartner Lee Associates Limited

Site Area LF - 4W
Observer(s) C. Hughes
Ground Condition very thin snow patches
Date of Visit Dec. 6, 1983
Map Sheet 1:10,000 78-4309-60-(66,67)
Time & Duration of Visit 1:30-3:00 p.m.
Air Photo 78-4308-60-(109,110)
Weather: Present rain, fog
Project O.W.M.C. No. 83 S9.1
Previous Day rain, drizzle
No. of Photos Taken 5

Purpose Field Reconnaissance to Verify Biological Data Base.

Vegetation - Onsite Largely cultivated farmland very gently rolling topography, very sparse low tree and shrub hedgerows a few small woodlots (Beech, Hard maple, occasional White Pine) and one larger woodlot on N. side of site, Beech, Maple, fair distribution of size classes, good Maple/Beech regeneration.

Vegetation - Adjacent cultivated farmland and pasture (some abandoned) sparse hedgerows and a few small mixed deciduous woodlots.

Aquatic Habitat Small streams and run-off channels seen to be running high from recent rains, probably intermittent, warm water, very turbid at this time, probably poor aquatic habitat (for important fisheries).

Wildlife Woodlots and hedgerows would support typical small mammals (i.e. mice, squirrels, rabbits) especially where beechnuts are available, also possible nesting sites for birds of prey (i.e. hawks, owls) as well as other woodland fringe birds (i.e. grouse, pheasant). Woodlots probably too small to provide habitat for larger animals (i.e. deer) and do not connect to larger woodlot areas.

Comments

Conclusions no unusual biological factors observed which would affect present site delineation. Pine planting on south edge of site not of significant wildlife value for some time to come.

Sketch

OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEU
- New SEU Woodlots > 20 ha
- ●3 Biological Observation Station and Number
- □▸ Photograph Taken and Direction

not to scale
MAXIMUM POTENTIAL ACQUISITION BOUNDARY

Key Map: **LF-4 West**
Lots 3,4,5; Concession IV (Block 4); Township of Glanbrook, formerly Township of Binbrook

1000 feet 0 1000
500 metres 500

Biological Observations For Site Area And Adjacent Lands
POTENTIAL SITE IDENTIFICATION
September 1984 **FIGURE G·B5**

The "conclusions" section of field forms outlined any major constraints associated with specific sites. SEUs, other vegetation, and aquatic and wildlife habitat conditions were the bases for drawing conclusions about each site.

Table 7 in the text, contains the summary comments on factors and the constraint rating for each site. Biological resources described are those which fall within the thick dashed lines on maps contained in Appendix F of Volume 2 - Identification of Potential Sites (Dillon 1984). The dashed lines are boundaries of site areas examined in the field.

Relatively few of the 90 sites were assigned a "major" constraint rating. A "major" constraint rating is merely an indication that there is potential for encountering biological resources of significance somewhere on-site. This rating does not trigger automatic rejection of the site from further consideration, since it may be possible to develop facilities in a way that is compatible with the significant biological resource present.

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
LF-1A1	-	-	Fields	4 intermittent creeks	No	Wooded stream valleys to northeast	No
LF-2A1	-	-	Fields	2 creeks: 1 intermittent and 1 permanent tributary of the West Humber River	No	-	Moderate
LF-1N	-	-	1 small wooded patch	1 intermittent creek through site	Possibly	-	Minor
LF-2N	-	-	Fields	3 intermittent drainage channels	No	-	No
LF-3N	-	-	Small deciduous woods	2 intermittent creeks, small ponds	Possibly	-	Minor
LF-4N	-	-	Wooded patches <20 ha in size	1 stream, small ponds	Possibly	-	Minor
LF-2W	-	Portion on-site	Young spruce plantation in some field areas	2 intermittent streams crossing site	Yes	-	Moderate
LF-3W	-	-	Several patches of deciduous woods; all under 20 ha	Tributaries to Wolf and Little Wolf Creeks on site (intermittent)	Possibly	-	Minor

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
LF-6W	-	-	2 small patches of deciduous woods	1 intermittent stream and tributaries drain through site	Possibly	Woodlots >20 ha (non-SEU) on the north and west boundaries of site	Minor
LF-5W	-	-	6 small patches of deciduous woods clustered in west portion of site	1 creek and intermittent tributaries drain through site	Possibly		Minor
LF-7W	-	Very minor intrusion of wooded complex on south boundary of site	-	6 small intermittent tributaries	Possibly	Non-SEU woodlot >20 ha on south boundary of site	Minor
LF-10W	SEU16-1 and contains an ANSI	-	Small scattered deciduous woods	3 intermittent creeks and tributaries	Yes	Portion of SEU 16-1 on-site: remainder extends to west. SEU 16-1 Lost Mile Woods Criteria satisfied: • high habitat diversity • rare species: plants: Acorus calamus, Carex bebbii, Geum borreale, Juncus effusus, Prunus americana Sagittaria latifolia, Stellaria longifolia, Veronica arvensis: Note: Prunus americana is rare in Ontario and Canada. All others are rare in Brant Co. Birds: Blue-winged teal, Marsh hawk, Pine warbler, Eagles et al., 1980 (185) *	Major

* BRACKETED NUMBER AFTER REFERENCE IS PAGE NUMBER ON WHICH DATA ARE FOUND.

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
LF-11W	-	1 woodlot >20 ha present in southeast corner of site	Several deciduous patches concentrated in centre and south portion of site	Intermittent headwaters of several streams: several ponds	Possibly	Continuous patches of deciduous woods off-site to the south and east	Moderate
LF-13W	Most of site occupied by SEU 17-1			3 intermittent creeks on the margins of site	Yes	Grand River nearby to west; North Cayuga Slough Forest - extensive forested wetland - diverse habitat - regionally rare flora OMNR 1983a(20) MacDonald 1980(60)	Major
LF-14W	-	-	Portions of 2 small deciduous woods on-site	2 intermittent creeks plus tributaries drain site	Possibly	-	Minor
LF-1C	Portions of SEU 18-27 on site	-	Scattered small parcels of deciduous woods: 1 large deciduous woodlot in centre of site	Scattered ponds	Yes	SEU 18-25 adjacent to west of site, Portions of SEU 18-27 on site, other portions extend to south and east off-site SEU 18-27 Farr's Road Woodlot criteria satisfied: o rare species: Swamp White Oak, Pin Oak, Brady et al., 1980 (MF 09)	Major

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
LF-2C	-	-	1 small pocket of deciduous woods and thickets in north-east corner of site	3 minor, intermittent creeks	Possibly	Abandoned Welland Canal along north boundary of site	Minor
LF-3C	-	2 non-SEU woodlots >20 ha on site and two near site	Small scattered patches of deciduous woods	4 intermittent creeks on margins of site	Yes	SEU 18-10 to west Beaver Creek adjacent to north of site Welland River adjacent to south of site	Moderate
LF-8C	-	1 non-SEU woodlot >20 ha on site	2 small patches of deciduous woods	Small scattered ponds	Yes		Moderate
LF-9C	-	-	Several small patches of mixed woods in centre of site	2 tributaries to Sucker Creek on site	Possibly	SEU 18-8 (including ANSIs) on east margin of site. Sucker Creek on west boundary of site	Minor
LF-12C	-	Large portions of two non-SEU woodlots >20 ha	-	1 intermittent creek and tributaries	Yes	SEU 9- adjacent to south and west of site	Moderate
LF-13C	-	Large portions of 3 non-SEU woodlots >20 ha on-site	-	3 intermittent creeks plus tributaries	Yes	SEU 8-7 (inc. ng ANSI) to south of site SEU 8-6 (including . 'Is) to west of site SEU 9-2 (including ANSIs) t. north of site non-SEU Woodlots >20 ha extend off-site to east	Moderate

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
LF-15C	Large portions of SEUs 18-14 and 18-16 (including AMSIs) on-site : 18-14 in west and 18-16 in east portion of site	1 non-SEU woodlot >20 ha in north central portion of site	Several small pockets of deciduous woods	Several intermittent headwater creeks	Yes	SEU 18-19 adjacent to south of site: AMSI 18-31 adjacent to north of site Portions of both SEU 18-14 (including AMSIs) and SEU 16-16 (including AMSIs) on-site SEU 18-14 Perry Road Woodlot Criteria satisfied: • water storage for Little Forkes and Forkes Creeks • rare species: plants: Swamp White Oak, Honey Locust, Chinquapin Oak Brady et al., 1980 (MF 04) OMNR 1983a (29) SEU 18-16 • water storage for Welland River and Forkes Creek • wildlife habitat • rare species: Pin Oak, Swamp White Oak, Pignut Hickory Brady et al., 1980 (MF 05) OMNR 1983a (29)	Major
LF-18C	-	Portion of non-SEU woods >20 ha in east portion of site	Small scattered wooded patches on-site	2 intermittent creeks and tributaries on site	Yes	-	Moderate
LF-24C	-	Portions of 3 non-SEU woodlots >20 ha on-site (deciduous)	-	2 intermittent creeks on west and south edges of site	Yes	SEU 18-2 off-site to southeast; 2 of the non-SEU woodlots >20 ha extend off-site	Moderate

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
LF-25C	Small part of SEU 18-4 in north part of site	-	2 small portions of deciduous woods on southern boundary of site	Several intermittent creeks	Yes	Small part of SEU 18-4 in north portion of site SEU 18-4 Silverdale Bush Criteria satisfied: • headwater tributary to 16 Mile Cr. and Welland River • wildlife habitat • diverse biological communities • large; 300 hectares • rare species - plants: Swamp White Oak Brady et al., 1980 (WL 08) OMNR, 1983a (28)	Major
LF-29C	-	-	3 small pockets of deciduous woods in north portion of site	2 intermittent creeks and tributaries on-site	Possibly		Minor
LF-30C	-	-	2 small patches of woods in east part of site	1 intermittent creek plus tributaries	Possibly	Welland River adjacent to south end of site	Minor
LF-1E	Large portions of SEU 19-2 on west margin and in north end of site	Portion of 1 non-SEU woods >20 ha in northwest portion of site	2 portions of woods in south part of site	1 intermittent creek along south boundary of site	Yes	Portions of SEU 19-3 adjacent to east of site, SEU 19-4 to NE Portions of SEU 19-2 on-site; SEU 19-2 Horse Track Woodlot Criteria satisfied: • rare species - plants: Swamp White Oak, Eastern Flowering Dogwood, Pignut Hickory, Chinquapin Oak, Black Oak Brady et al., 1980 (NF 07)	Major

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
LF-2E	-	-	Fields	2 intermittent creeks and tributaries	No	Same site as PI-21E	No
LF-3E	SEU 19-2 in southwest corner of site	-	Large patches of deciduous woods on-site	1 intermittent creek in southern portion of site. Temporary ponds	Yes	SEU 19-3 adjacent to southeast of site. Portion of SEU 19-2 in southwest corner of site SEU 19-2 Horse Track Woodlot Criteria satisfied: • rare species - plants: Swamp White Oak, Eastern Flowering Dogwood, Pignut Hickory, Chinquapin Oak, Black Oak Brady et al., 1990 (MF 07) Same as PI-6E	Major
LF-4E	-	-	Small scattered deciduous woods	1 intermittent creek plus tributaries in southern portion of site	Possibly	SEU 19-4 adjacent to north SEU 19-5 adjacent to west SEU 19-6 adjacent to south	Minor
LF-6E	-	Most of 1 non-SEU woodlot >20 ha in centre of site	A few small deciduous woodlots	3 small intermittent creeks	Yes		Moderate
LF-7E	-	-	4 small deciduous woodlots	2 small intermittent creeks and ditches	Possibly	Welland Canal (abandoned) on west boundary of site	Minor

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTORS COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
LF-8E	-	Portion of 1 non-SEU woodlot >20 ha in west part of site	Several small scattered deciduous woodlots	A few small intermittent creeks	Yes	1 non-SEU woodlot >20 ha adjacent to north side of site	Moderate
LF-9E	3 portions of SEU 13-8 scattered on-site	-	Several small deciduous patches of woodland	2 intermittent creeks; scattered, small ponds on-site.	Yes	SEU 13-8 continues off-site to north, east and south. SEU 19-4 adjacent to west site boundary. SEU 13-8: Willoughby Marsh Criteria satisfied: • Water storage and recharge for Welland River, Tea, Ussher and Black Creeks • Large wildlife habitat • Representative wetland feature • Rare Species: Plants Swamp White Oak, Pignut Hickory, Pin Oak Brady et al., 1980 (NF 11) OMNR 1983 (a,d)(28,29) Regional Municipality of Niagara, 1981	Major
LF-10E	SEU 19-1 in centre of site	Major portion of non-SEU woodlot >20 ha in south part of site	Several small deciduous woodlots	Grassy Brook and numerous intermittent tributaries drain site	Yes	SEU 19-1 almost entirely within site SEU 19-1: McKenney Road woodlot Criteria satisfied: • Rare Species - Plants: Swamp White Oak, Pin Oak Brady et al., 1980 (WC 01)	Major

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
LF-12E	SEU 13-8 on-site	-	Several small and large scattered deciduous wooded patches	1 intermittent creek in north end of site. Scattered ponds.	Yes	SEU 13-8 continues off-site to north and east SEU 13-8 Willoughby Marsh Criteria satisfied: • water storage and recharge for Welland River, Tee, Ussher and Black Creeks • large wildlife habitat • representative wetland feature • rare species: plants: Swamp White Oak, Pignut Hickory, Pin Oak Brody et al., 1990 (NF 11) OMNR 1983 (a,d)(28,29) Regional Municipality of Niagara, 1981	Major
P1-1A1		-	Wooded patches <20 ha in size	4 intermittent creeks	Possibly	Wooded stream valleys to north-east (same as LF-1A1)	No
P1-2A1	-	-	Fields	1 intermittent creek	No	-	No

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
P1-3A1	-	-	Fields	2 creeks: 1 intermittent and 1 permanent tributary of the West Humber River	No	-	Moderate
P1-1N	-	-	1 small deciduous woodlot on site	1 intermittent creek on site boundary	Possibly	Small deciduous woods adjacent: primarily farmland	Minor
P1-2N	-	-	Fields	1 intermittent creek on site	No	-	No
P1-3N	-	-	1 small deciduous woodlot	1 intermittent creek plus tributaries to Fletchers Creek Other intermittent creeks	Possibly	-	Minor
P1-4N	-	-	Fields	1 intermittent creek plus tributary	No	-	No
P1-5N	-	-	2 small deciduous woodlots	2 intermittent creeks	Possibly		Minor
P1-6N	-	-	Fields	1 intermittent creek	No	-	No

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
PI-10N	-	-	1 small orchard on east side of property	1 intermittent creek plus tributaries (leading to 16 Mi Crk)	Possibly	SEU 5-2 to the south and west of site	Minor
PI-11N	-	-	1 small deciduous woodlot	2 intermittent creeks plus tributaries on-site (leading to 16 Mi Crk)	Possibly	SEUs 5-1,5-2 to southeast of site	Minor
PI-12N	-	-	1 small deciduous woodlot and one small orchard on-site	2 intermittent creeks plus tributaries on-site (leading to 16 Mi Crk)	Possibly	SEUs 5-1, 5-2 to southeast of site	Minor
PI-13N	SEU 5-2 in southeast corner of site	-	Wooded patches >20 ha in size, small orchard	2 intermittent creeks on site (leading to 16 Mi Crk)	Possibly	SEU 5-2 continues off site, Sixteen Mile Creek Valley, ESA Criteria satisfied: • ground water discharge area, • high quality forests • high diversity of communities • provincially and nationally rare plants • large size of unit, Reg. Mun. of Halton, 1978 (119).	Major
PI-14N	SEU 5-2 just touching south-western site boundary		1 small orchard on site	2 intermittent creeks crossing site boundaries (leading to 16 Mi Crk)	Possibly	SEUs 5-1, 5-2 to south and east of site	Moderate
PI-15N	-	-	Parts of 3 small deciduous woodlots in south end of site	1 intermittent creek in southwest corner of site	Possibly	SEU 5-1 adjacent to east site boundary	Minor

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
P1-2W	-	-	Several small deciduous woodlots	4 intermittent creeks plus tributaries on-site	Possibly	Non-SEU woodlot >20 ha containing ANSI 6-1 to southeast of site	Minor
P1-3C	-	-	Part of 1 small deciduous woodlot	2 intermittent creeks	Possibly	SEU 10-3 to southeast of site	Minor
P1-2C	-	Large portions of 3 non-SEU woodlots >20 ha on-site	-	3 intermittent creeks plus tributaries	Yes	SEU 8-7 (including ANSI) to south of site SEU 8-6 (including ANSIs) to west of site SEU 9-2 (including ANSIs) to north of site non-SEU woodlots >20 ha extend off-site to east	Moderate
P1-11C	Small part of SEU 10-4 in north part of site	-	2 small portions of deciduous woods on southern boundary of site	Several intermittent creeks	Possibly	Small part in SEU 10-4 in north of site. SEU 10-4: Silverdale Bush: Criteria Satisfied: • headwater tributary to 16 Mi Cre and Welland River • Wildlife habitat • Diverse biological communities • Large; 300 hectares • Rare Species: Plants Swamp White Oak Brady et al., 1980 (WL 08) OMNR, 1983a (28)	Moderate

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
PI-15C	-	Portion in southeast corner of site	Other small deciduous woods	2 intermittent creeks	Yes	SEU 11-1 to northeast	Moderate
PI-19C	Part of SEU 8-5	Portion in southeast corner of site	-	1 or more intermittent streams	Yes	SEU 8-5 continues off-site to northeast SEU 8-5 Inverary Woods Criteria satisfied: • Rare species, plants: Wild Plum, Swamp White Oak • headwater of Mill Creek • high quality plant and animal community, Brady et al., 1980 (ML 0)	Major
PI-21C	-	Portions of 3 non-SEU woodlots >20 ha on-site deciduous	-	2 intermittent creeks on west and south edges of site	Yes	SEU 18-7 off-site to southeast	Moderate
PI-22C	-	Large portions of 2 non-SEU woodlots >20 ha in southern half of site	-	Portions of 3 intermittent creeks on-site	Yes	SEU 18-2 off-site to the south	Moderate
PI-25C	-	-	Several small deciduous woodlots scattered over site	3 intermittent creeks plus tributaries	Possibly	-	Minor
PI-26C	-	2 non-SEU woodlots >20 ha on site and 2 near site	Small, scattered patches of deciduous woods	4 intermittent creeks on margins of site	Yes	SEU 18-10 to west, Beaver Creek adjacent to north of site; Welland River adjacent to south of site	Moderate
PI-1E	Part of SEU 13-3 in north part of site	Portion of non-SEU woodlot >20 ha in southwest part of site	Other small deciduous woods	2 small intermittent creeks	Yes	SEU 13-3 continues off-site to north SEU 13-3 Ramsey Road Woodlot Criteria satisfied: • Rare Species: Plants: Swamp White Oak, Pin Oak, Pignut Hickory Brady et al., 1980 (NF 04)	Major

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
P1-2E	Portions of site covered by SEU 13-3	Large part of site (southern half) covered by non-SEU Woodlot >20 ha		1 intermittent creek in southern part of site	Yes	Part of SEU 13-3 in north half of site SEU 13-3: Ramsey Rd. Woodlot Criteria Satisfied: • Rare Species: Plants: Swamp White Oak, Pin Oak, Pignut Hickory Brady et al., 1980 (NF 04)	Major
P1-3E	Part of SEU 13-2 in southern portion of site	Most of site is covered by non-SEU woodlot >20 ha	Thicket areas in central portion of site	2 intermittent creeks on-site	Yes	Welland River adjacent to south of site SEU 13-2: Cyanamid Corners Criteria satisfied: • recharge to Welland River and Thompson Creek • diverse biological communities • rare species - plants Swamp White Oak, Black Walnut, Chinquapin Oak, Pin Oak Brady et al., 1980 (NF 02) SEU 13-2 extends off-site to west	Major
P1-4E	-	-	Thicket patches in north of site area	1 intermittent creek in southwest portion of site	Possibly	Thompson Creek adjacent to north SEU 13-2 adjacent to north and east of site Welland River adjacent and south of site	No

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
P1-5E	-	Portion of 1 in northeast corner of site	Small scattered deciduous woodlots scattered on-site	2 intermittent creeks and 1 pond	Yes	Non-SEU woodlot >20 ha adjacent to west of site SEU 13-1 adjacent to north of site Welland River nearby to south	Moderate
P1-6E	Portion of SEU 19-2 in southwest corner of site	Portion of non-SEU woodlot >20 ha in northeast portion of site	Large patches of deciduous woods on-site	1 intermittent creek in southern portion of site	Yes	SEU 19-3 adjacent to southeast of site. Portion of SEU 19-2 in southwest corner of site SEU 19-2 Horse Track Woodlot Criteria satisfied: • Rare Species: Plants: Swamp White Oak, Eastern Flowering Dogwood, Pignut Hickory, Chinquapin Oak, Black Oak Brady et al., 1980 (NF 07)	Major
P1-7F	Portion of SEU 19-2 on-site	Portion of non-SEU woodlot >20 ha in east portion of site	-	2 intermittent creeks	Yes	SEU 19-2 extends off-site to southeast SEU 19-1 north of site woodlot >20 ha extends off-site to east SEU 19-2 Horse Track Woodlot Criteria Satisfied: • Rare Species: Plants: Swamp White Oak, Eastern Flowering Dogwood, Pignut Hickory, Chinquapin Oak, Black Oak Brady et al., 1980 (NF 07)	Major

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
P1-8E	-	1 non-SEU woodlot >20 ha in west half of site	1 small deciduous woodlot in east half of site	2 intermittent creeks plus tributaries	Yes	SEU 19-1 adjacent to north side of site	Moderate
P1-9E	Small portion of SEU 13-8 in northwest corner of site	-	2 deciduous forest patches	2 intermittent creeks	Yes	SEU 13-8 extends off-site to the west SEU 13-8: Willoughby Marsh Criteria Satisfied: • Water storage and recharge for Welland River, Tea, Ussher and Black Creeks • large wildlife habitat • representative wetland feature • Rare species: Plants: Swamp White Oak, Pignut Hickory, Pin Oak Brady et al., 1980 (NF 11) OMNR 1983 (a,d)(28,29) Regional Municipality of Niagara, 1981	Major
P1-10E	-	2 non-SEU woodlots >20 ha in northwest and southeast portions of site	Scattered, small deciduous patches of woods	1 intermittent creek (Bayers Crk)	Yes	-	Moderate

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
P1-11E	-	Portions of 2 of these woodlots on site	Small deciduous woodlands	Small intermittent creeks	Possibly	Black Creek flows along eastern boundary of site	Moderate
P1-12E	-	-	2 small deciduous woodlots	Scattered ponds associated with golf course	Possibly	SEU 13-3 adjacent to southeast of site Non-SEU woodlot >20 ha adjacent to northeast of site Beaver Creek adjacent to east of site	Minor
P1-13F	-	-	Scattered, small deciduous woodlots	2 intermittent creeks; scattered ponds.	Possibly	Beaver Creek adjacent to west of site, SEU 13-12 adjacent to southeast corner of site	Minor
P1-14F	Small Portion of SEU 13-13 on western edge of site	-	Small deciduous woodlands	1 intermittent creek	Yes	Beaver Creek adjacent to west of site	Major
P1-15E	-	-	Small deciduous woodlot in centre of site	-	Possibly	SEU 13-13 adjacent to east boundary of site Beaver Creek adjacent to east Black Creek adjacent to west	Minor

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTORS COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
P1-16E	Small portion of SEU 13-13 on east side of site area	1 non-SEU woodlot >20 ha in west half of site	Minor patches of deciduous woods	1 large pond in south end of site	Yes	Beaver Creek adjacent to east: Black Creek adjacent to west	Major
P1-17E	-	-	2 small deciduous wooded patches in south half of site	Scattered small ponds	Possibly	-	Minor
P1-18E	-	-	Very small thickets and deciduous wooded patches	1 intermittent creek: scattered ponds	No	Non-SEU woodlot >20 ha off site, adjacent to southwest	Minor
P1-19E	-	-	1 small patch of deciduous woods in centre of site	1 intermittent creek plus tributaries in north half of site	Possibly	SEU 18-34 off-site to east	Minor
P1-20E	-	-	Scattered, sparse deciduous hedgerows	Intermittent drainage ditch along southern site boundary	Possibly	SEU 12-1 off-site to south	Minor
P1-21E	-	-	Fields	2 intermittent creeks plus tributaries	No	Same site as LF-2E	No
P1-27E	-	-	Several large patches of deciduous woods scattered throughout site	2 intermittent creeks (northern creek-Grassy Brook flows to Welland River; southern stream drains to Lyons Creek)	Possibly	SEU 19-2 and 19-3 off-site to south, SEU 13-2 off-site to north	Minor

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
P1-30F	SEU 19-1 in centre of site	Major portion of non-SEU woodlot >20 ha in south part of site	Several small deciduous woodlots	Grassy Brook and numerous intermittent tributaries drain site	Yes	SEU 19-1 almost entirely within site SEU 19-1: McKenney Road woodlot Criteria satisfied: Rare Species - Plants: Swamp White Oak, Pin Oak Brady et al., 1980 (WE 01)	Major
P1-31F	-	Portions of 1 non-SEU woodlot >20 ha in east half of site	Numerous, small, scattered deciduous woodlots	3 intermittent creeks plus tributaries drain site	Yes	Portion of SEU 13-14 adjacent to south of site	Moderate
P1-34E	-	Portion of 1 non-SEU woodlot >20 ha in west part of site	Several small scattered deciduous woodlots	A few small intermittent creeks	Yes	1 non-SEU woodlot >20 ha adjacent to north side of site	Moderate
P1-37E	SEU 13-8 covers much of site, 1 small portion of SEU 19-4 extends into western edge of site	-	Numerous scattered, deciduous woodlots	1 intermittent creek in north half of site; scattered small ponds	Yes	SEU 19-4 continues off-site to west and north. SEU 13-8 continues off-site to north and east. SEU 19-4 Lyons Creek Floodplain Wetland ANSI: diverse wetland community OMNR, 1983 (28,29). SEU 13-8: Willoughby Marsh. Criteria Satisfied: o water storage and recharge for Welland River, Tea, Ussher and Black Creeks, o large wildlife habitat, o representative wetland feature, o rare species - plants: Swamp White Oak, Pignut Hickory, Pin Oak Brady et al., 1980 (WF 11) OMNR (1983)(a,d)(28,29)(R.M. Niagara 1981)	Major

Assessment of Sites Visited
Step 2 During Identification of Potential Sites

Table 7

SITE	FACTOR COMMENTS					COMMENTS	CONSTRAINT
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Terrestrial Wildlife Habitat		
PI-26E	Portions of SEUs 19-2 and 19-3 on-site	Present	Small deciduous woodlots and coniferous plantations on-site	Intermittent creeks	Yes	Portions of SEU 19-2, Horse Track Woodlot, on-site. Criteria satisfied: o rare species - plants: Swamp White Oak, Eastern Flowering Dogwood, Pignut Hickory, Chinquapin Oak, Black Oak. Brady et al., 1980 (NF 07) Portions of SEU 19-3, Young Woodlot, on-site Criteria satisfied. o rare species - plants: Swamp White Oak, Pignut Hickory, Brady et al., 1980 (NF 08)	Major

IDENTIFICATION OF CANDIDATE SITES

Sixteen sites were compared during the final stage of Phase 3. These were:

PI-1A1	LF-1C
PI-1N	LF-3C
PI-13N	LF-8C
LF-2N	LF-9C
LF-4N	LF-1E
PI-2W	LF-3E
LF-10W	PI-18E
LF-11W	PI-27E

Conditions on the sites, adjacent lands and along alternative access routes to and between sites, in the case of partially integrated facilities, were evaluated.

Observations made during site screening aided in assessing site characteristics during candidate site identification. Biological considerations were among the broad range of selection factors applied during identification of candidate sites.

METHODS

FACTORS APPLIED

The SEU and Non-SEU Woodlot factors originated during the identification of site areas were carried through to this stage. They played an important role in grouping potential sites according to biological constraints. When examined at 1:10,000 scale, certain non-SEU Woodlots which were thought to cover 20 ha were found to be fragmented and to consist of smaller segments.

All factors identified during Step 2 of the screening stage *(other vegetation, aquatic habitat, wildlife habitat)* were also carried forward and used for the identification of candidate sites.

To these factors, another was added at the "candidate site" level of investigation. This factor is *local setting*. This relates each site to surrounding biological features. For example, vegetated corridors or valleys which connect the site to surrounding lands, as well as adjacent SEUs, were noted.

To allow comparison of alternate access routes, one final factor was selected. *Stream crossings* along each access route were identified and related to potential for interference with fishery considerations in the event of an accidental spill. A constraint rating was determined for each complete access option. A "no-constraint" interpretation was assigned if there were few stream crossings and they all were intermittent streams with no known sensitive use. "Major constraint" status was assigned in instances where important fish populations or migratory routes occurred downstream of crossings. Minor and moderate constraints were assigned to combinations of various numbers of streams crossed with and without sensitive uses.

Biology factor sheets for this stage of the process are included in Appendix V.

SITES

Site maps at a scale of 1:10,000 were provided to us. These maps showed potential acquisition areas. study areas and buffer zones appropriate to the facility type. Potential boundaries for the extent of land acquisition were also mapped. Generally these boundaries differed somewhat from those provided at the previous stage in the process (see Site Selection Report, Dillon, 1984).

Three sites, PI-1N, LF-10W and, LF-1E, each had two "parcels" which were evaluated separately. Evaluation methods were the same as for other sites.

Except for LF-10W and LF-1E, which had two parcels, the biology "site" was all land within the acquisition limit boundary. The Dillon Site Selection Report (1984) describes study areas.

Since biological systems are not usually defined by property boundaries, our analysis was an integrated assessment of the site and adjacent lands. The extent of adjacent lands is undefined and depends on site-specific conditions. Adjacent lands contained resources which were described by the local setting factor.

For landfill (LF) sites, modifications to the landscape might be made throughout the acquisition area; for physical/chemical-incinerator (PI) sites, the major changes would occur where the facility buildings are placed with little or no modification occurring elsewhere within the remainder of the land acquired as a buffer. Since the greatest potential for impact resulting from construction is on the acquired lands, these lands were the primary focus of the present analysis. As noted above, we determined what biological resources were present adjacent to site boundaries, and if stream courses or wooded corridors connect the site to adjacent lands.

Field observations gathered during the site screening work were available for all sites. Aerial photography at 1:10,000 scale, taken in 1978, and airphotos taken in 1983 were examined. These were used to prepare vegetation cover type maps for each site. These maps indicate the types of vegetation which dominate the vegetation units identified. Narrow hedgerows and small patches of trees and shrubs around

buildings were not delineated as vegetation units. Where pockets of residential and industrial land occur within the "field" cover type, these were not distinguished.

Larger forest and thicket patches were characterized as deciduous, mixed or coniferous. If an obvious coniferous element was present in a deciduous forest a mixed forest designation was assigned. Since the airphotos are not current and land use on non-treed areas may vary from year to year, we did not attempt to differentiate between cultivated and uncultivated fields. Cover type mapping was not field checked.

Vegetation cover types are not a factor, but they were mapped to provide additional information which contributed to interpretation of certain factors. For example, the variety and interspersion of vegetation cover types is one component of assessing the "wildlife habitat" factor. Together, vegetation cover maps and site screening field observations were used to determine the type and general extent of woodlot coverage, to identify water bodies which could not be seen from roadsides and to interpret wildlife habitat value.

Maps at 1:10,000 scale were prepared which illustrate the vegetation cover types and SEUs present on or adjacent to each potential site. These maps have been reduced and appear in Appendix III as Figures G-B6 through G-B23. Judgement was used in determining which features outside the acquisition limit and study area radii should be mapped. SEUs and large woodlots which were physically connected or which appeared to be functionally associated with features within the study area radii were mapped.

It should be noted that boundaries of certain SEUs shown on Appendix III maps should be considered to be "soft". This

is the case since we transferred boundaries to the 1:10,000 scale maps from maps with much poorer boundary resolution and few geographic features to use as reference points. Certain areas of important biological resources (AIBRs) provide an example of how mapping scale influences data presentation and interpretation. Certain wetland habitats were mapped at 1:50,000 by transfer of areas shown in MNR District Land Use Guidelines. When 1:10,000 maps were prepared for potential sites it was necessary to define AIBR boundaries more precisely. For the Lyons Creek AIBR, MNR has indicated that the margin of the floodplain should be considered as the boundary. At the 1:10,000 scale the floodplain interpreted by our physical resource colleagues extends farther upstream than did the AIBR units portrayed in the map portfolio. Thus, on the potential site maps, in order to show areas which are potentially of biological significance, we have shown these upstream portions of Lyons Creek as SEU.

For sites which become candidate sites, more precise resolution of SEU boundaries will be sought through agency contact in Phase 4A. Nonetheless, the mapping available was adequate for this stage of analysis.

Table III.1 in Appendix III briefly describes certain points to be aware of regarding each site, e.g. study unit boundaries. SEUs with "soft" boundaries are noted.

Vegetation mapping in Appendix III is not presented on the basis of factors, apart from the documentation of SEUs. Aquatic habitat is not mapped because its extent and quality could not be properly field checked in winter. Site-by-site comments for this factor appear in Table 8. "Wildlife habitat" and "local setting" are also not mapped. The

comments on these two factors, which appear in Table 8, were derived, in part, from the maps contained in Appendix III. "Local setting", for example, was determined by examining SEUs and other vegetation patterns on the site and adjacent lands.

Comparison of potential sites was completed using the method applied in Step 2 of identification of potential sites except that an additional factor was involved at this stage.

Potential sites were assigned to one of four constraint groupings: no, minor, moderate or major constraint. The appropriate constraint grouping was determined by examining the comments recorded about each biological factor in Table 8.

If ratings for a site which advanced to the identification of candidate sites stage differ from those for the same site during identification of potential sites, it is because site boundaries were refined as the study progressed, and additional data analysis had occurred.

Factor ranking was as in earlier stages of the process. SEUs were of most significance and non-SEU Woodlots >20 ha in size were of secondary significance in determining constraint. Other factors are described briefly, below.

Since sites have been selected to avoid major water bodies, the extent of aquatic habitat is expected to be limited, but intermittent streams and ponds may provide habitat for certain fish, reptiles and amphibians. The presence of water also makes an area more valuable for terrestrial wildlife. Aquatic habitat was considered to be of less relative significance in comparing sites than SEUs and non-SEU Woodlots >20 ha in size. This is the case because the site selection process generally avoided including major

water bodies within site boundaries.

Two of the factors -- terrestrial wildlife habitat and local setting -- served to reinforce the constraint assessments which were mainly based on examination of the first four factors in Table 8. The possible existence of terrestrial wildlife habitat, with an emphasis on woodland species, was assigned one of three descriptors: no, possibly or yes. As noted in the factor sheets, at this time we cannot determine habitat quality. Local setting was also interpreted from other factors, i.e. SEUs, woodlots, other vegetation and aquatic systems.

A "no constraint" rating was assigned to sites which had little natural vegetation cover, few water bodies, and little potential for providing wildlife habitat. Sites with minor constraints often had small wooded patches or thickets, possibly including parts of non-SEU woodlots larger than 20 ha, a few ponds and/or intermittent streams, some potential as terrestrial wildlife habitat and limited or no significant biological connection to adjacent lands.

Although non-SEU Woodlots greater than 20 ha in area were considered to provide potentially valuable wildlife habitat, the intrusion of a small part of a large woodlot onto a site was not necessarily as significant as the occurrence of several smaller patches of woodlot. The latter type of habitat might be valuable for "edge" species.

A moderate constraint was assigned to a site which contained patches of woods less than 20 ha in size, a stream and ponds, wildlife habitat and a feature which functionally connected the site with adjacent lands. Major constraint ratings were assigned to sites containing SEUs within the acquisition area boundary. Major constraint sites usually had wildlife habitat potential.

ACCESS ROUTES

Terrestrial systems were not analysed because it was assumed that no road widenings would be required. Impacts on aquatic systems might be considerable if a spill occurred.

Access routes were shown on 1:50,000 scale topographic map bases. Each stream crossing was numbered on working maps. In a raw data chart, the stream name and any known sensitive use were recorded for each stream crossing identified.

The data base available for identifying sensitive water uses consisted of information on fisheries collected during the constraint mapping inventory. We also used descriptions of major intakes and outfalls, located primarily along rivers and the Great Lakes, collected for the surface water considerations report (Gartner Lee Associates Limited and Gore & Storrie Limited, 1984). Thus, it should be recognized that the present analysis does not completely document existing human and livestock use of streams crossed by access routes, but is related mainly to biological considerations.

The access route analysis completed to date should be regarded only as an indication of types of potential concerns associated with certain access options. Once more detailed data searches are completed and the information is cross-checked, it is expected that other sensitive uses will be identified.

The number of stream crossings was reported under four headings: sensitive use known, no sensitive use known (subdivided into number of permanent and intermittent stream crossings), and total number. For streams which are crossed more than once, the actual number of crossings is recorded.

There are several access route options for many sites. Route options are described according to Dillon (1984). For partially integrated facility options, the travel route from 400 series highways went to the physical/chemical treatment-incinerator (PI) site first and then to the landfill (LF) site. The access routes were broken into regional road and local road segments. The numbers and types of stream crossings for these types of roads were reported separately.

The result of the access route analysis was a constraint rating -- one for local and one for regional road segments. This rating, as noted above, resulted from an analysis of the relative numbers and types of streams crossed by each route.

SITING OPTIONS

Results of the site and access route assessments are reported separately in Table 8 and Appendix IV, respectively. It is valuable, however, to provide results of findings relating to facility options in a consolidated format. The method used to do this follows.

The combinations of sites contributing to partially integrated siting options were provided by the site selection manager. These combinations and potential totally integrated facility sites, along with their associated access routes were examined.

A table was created which notes the level of constraint associated with each site and preferred access road(s). An absolute consolidated assessment of constraint for each site option including access route was not determined as there are so many unknowns associated with spill probabilities along

particular access routes. The table allows for a relative comparison of site options from a biological point of view.

RESULTS

SITES

Figures G-B6 through G-B23 in Appendix III, illustrate vegetation cover types and SEUs present on and adjacent to sites compared for the identification of candidate sites. This mapping along with field observations during the previous stage of site selection were used to complete the assessment of sites as reported in Table 8.

Comments on each factor are contained in Table 8. Descriptions of features present within SEUs appear under the "comments" heading. A preliminary constraint grouping is provided for site comparison purposes.

It is evident from Table 8 that 10 sites had minor or no apparent biology factor constraints associated with them, whereas five sites were considered to have major constraints because portions of SEUs were within the land acquisition boundaries. Species of trees and shrubs which are considered to be rare in Ontario and/or Canada were present in all of the SEUs.

Constraint ratings were the same for both parcels of each of the three sites which had two parcels. Factor comments vary, however, because slightly different resources fall within the sites.

Assessment of Potential Sites Based on Biology Factors

Table 8

SITE	BIOLOGY FACTORS						COMMENTS	CONSTRAINT GROUPING
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Wildlife Habitat	Local Setting		
PI-1A1	-	-	wooded patches, <20 ha in size	streams, tributaries to W. Humber River	possibly	wooded stream valleys, extending off-site to northwest and southeast, parcel of woods to west		Minor
PI-1N East	-	-	wooded patches, <20 ha in size	several intermittent streams	possibly	surrounded by farmland, SEU 5-2 to northeast		Minor
PI-1N West	-	-	wooded patches <20 ha in size	several intermittent streams	possibly	surrounded by farmland, SEU 5-2 to northeast		Minor
LF-2N	-	-	fields	3 intermittent drainage channels	no	2 small wooded patches to northeast of site		No
LF-4N	-	-	wooded patches, <20 ha in size	1 stream, small ponds	possibly	non-SEU woodlots <20 ha adjacent, north, south and east of site		Minor
PI-13N	SEU 5-2 in southeast corner of site	-	wooded patches, <20 ha in size, small orchard	several intermittent drainage channels	possibly	SEUs 5-1 and 5-2 to the east and south of the site	creeks from the site drain to SEUs; SEU 5-1 salmonid migration route (Sixteen Mile Creek); SEU 5-2 ANSI & ESA: 5 provincially rare plants, 3 plant species rare in Halton Region Source: R.M. Of Halton, 1978.	Major
PI-2W	-	small portion of non-SEU woodlot >20 ha which contains ANSI 6-1	small wooded patches, <20 ha in size	several intermittent streams	possibly	non-SEU woodlots >20 ha to southeast	ANSI 6-1 to south of site	Minor

Assessment of Potential Sites Based on Biology Factors

Table 8

SITE	BIOLOGY FACTORS						COMMENTS	CONSTRAINT GROUPING
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Wildlife Habitat	Local Setting		
LF-10M a	portions of SEU 16-1	-	other small patches of woody vegetation	small streams	yes	SEU 16-1 extends off-site to west	SEU 16-1 is Lost Mile Woods. Wild plum rare in Ontario and Canada, 7 plant species rare in Brant County, high diversity of habitats. Source: Eagles et al., 1980	Major
LF-10M b	portions of SEU 16-1	-	-	small streams	yes	SEU 16-1 to west and north	SEU 16-1 is Lost Mile Woods. Wild plum rare in Ontario and Canada, 7 plant species rare in Brant County, high diversity of habitats. Source: Eagles et al., 1980.	Major
LF-11M	-	present	other small patches of woody vegetation	several intermittent streams, one pond	possibly	numerous ponds and intermittent streams on adjacent land, small wooded patches off-site to east		Minor
LF-1C	-	-	wooded patches, <20 ha in size	scattered ponds and swales	yes	SEU 18-27 to south and east, SEU 18-25 to west of site, Welland River is north of the site		Minor
LF-3C	-	-	wooded patches, <20 ha in size	Beaver Creek, ponds	yes	Beaver Creek valley extends off-site, SEU 18-10 (ANSI) in non-SEU woodlot >20 ha to west, fragmented woods <20 ha in size to east		Moderate

Assessment of Potential Sites Based on Biology Factors

Table 8

SITE	BIOLOGY FACTORS						COMMENTS	CONSTRAINT GROUPING
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Wildlife Habitat	Local Setting		
LF-8C	-	-	small wooded and thicket patches	intermittent tributary to Sucker Creek, pond(s)	possibly	Sucker Creek to west, SEU 18-8 to north; wooded patches each <20 ha to east of site; Welland River is to the south		Minor
LF-9C	-	-	small wooded patches, thickets	drainage channels, swales	possibly	Sucker Creek to east, non-SEU woodlot >20 ha to north of site; SEU 18-8 to east and SEU 18-4 to northwest		Minor
LF-1E a	portion of SEU 19-2	present	other small patches of woody vegetation	intermittent stream	yes	portions of SEU 19-2 and 19-3 adjacent	SEU 19-2 is Horsetrack Woods, 5 woody plant species rare in Ontario and/or Canada	Major
LF-1E b	portion of SEU 19-2 portion of SEU 19-4	-	woodlot <20 ha in size	intermittent stream, pond	yes	portions of SEUs 19-2 19-3, 19-4, 19-5 and 13-6 adjacent; non-SEU woodlot >20 ha to northwest	SEU 19-2 is Horsetrack Woods, 5 woody plant species rare in Ontario and/or Canada SEU 19-4 is Lyons Creek Floodplain Wetland Candidate Nature Reserve, Important Wetland, Diverse meander stream landforms	Major
LF-3E	SEU 19-2 in SW corner of site portion of SEU 19-4	-	non-SEU woodlots, <20 ha in size	temporary ponds	yes	portions of SEU 19-2 to west and south; SEU 19-3 to south of site and SEU 19-4 to the east; Welland R. to the north	Features of significance in SEU 19-2 (Horsetrack Woodlot); five woody plant species rare in Ontario and/or Canada - Swamp White Oak, Eastern Flowering Dogwood, Pignut Hickory, Black Oak, Chinquapin Oak, Source: Brady et al., 1980. SEU 19-4 is Lyons Creek Floodplain Wetland Candidate Nature Reserve, Important Wetland, Diverse meander stream landforms	Major

Assessment of Potential Sites Based on Biology Factors

Table 8

SITE	BIOLOGY FACTORS						COMMENTS	CONSTRAINT GROUPING
	SEUs	Non-SEU Woodlot >20ha	Other Vegetation	Aquatic Habitat	Wildlife Habitat	Local Setting		
PI-18E	-	-	wooded patches, <20 ha in size	1 creek - possibly intermittent, scattered ponds	no	non-SEU woodlot >20 ha to west; SEU 18-29 to southwest		Minor
PI-27E	portion of SEU 19-4	-	several wooded patches <20 ha in size	Grassy Brook, un-named tributary to Lyons Creek	possibly	Welland River to north; SEUs 13-5, 13-2, 19-4 and 19-2 to north, east and south of site, respectively.	SEU 19-4 is Lyons Creek Floodplain Wetland Candidate Nature Reserve, Important wetland, Diverse meander stream landforms	Major

It is important to note that sites which were examined at this stage of the site selection process generally had fewer biological constraints than did many sites which had been screened out earlier. Also, boundaries of potential sites had been carefully defined, often avoiding inclusion of significant environmental units.

Site boundaries as defined on the figures in Appendix III show the maximum extent of land that might be acquired. It is possible that following further, more detailed study, portions of sites may not be required. This process of refining site boundaries may facilitate planning which will minimize impacts on SEUs and other biological resources.

The constraint grouping comments which occur in Table 8 should be considered to represent a preliminary assessment of the extent to which site biology might constrain development. More detailed assessment of the candidate sites will be completed during Phase 4.

A "major" constraint description in Table 8 merely indicates that some area of an SEU intrudes onto the site and that if the entire site were cleared and the SEU destroyed, it is highly likely that an impact of undefined magnitude would occur. A major constraint assessment at this stage does not mean that the site is definitely unsuitable from a biological perspective. Further study might indicate that no significant environmental functions or attributes exist in the portion of SEU which would be affected by facility construction and operation. Also it may be possible to avoid potential impact through judicious design of facilities. Inclusion of SEUs and larger woodlots in buffer zones could provide a visual buffer for facilities

and afford these important biological resources some protection through proper land management by OWMC.

ACCESS ROUTES

Appendix IV contains the results of the alternative access road analysis based on the number and type of streams crossed. Constraint ratings are presented separately for local and regional roads. It is evident from Appendix IV that for some sites and facility combinations only minor constraints were posed by stream crossings along alternative access routes, e.g. PI-27E, LF-2N. For others though, most access options crossed or ran adjacent to streams or rivers which contained significant fish populations, e.g. Bronte Creek.

A "major" constraint does not imply rejection of that access option or rejection of the site if all access options have been assigned a major constraint ranking. The present analysis serves to highlight potentially significant crossings which will be studied more carefully during detailed evaluation of access routes to candidate sites. Stream crossings were one of a number of factors which were used to assess and compare access route options during initial comparative evaluation. As well, further information such as materials to be hauled, risk of accidental spills, etc. remain to be assessed in evaluating alternative access roads.

Maps at a 1:50,000 scale which show the location of each stream crossing and tables summarizing general stream characteristics and biological use are contained in working data binders deposited with OWMC.

SITING OPTIONS SUMMARY

Table 9 contains a consolidation of the biological constraint associated with siting options considered during identification of candidate sites. Constraints associated with each site and with their preferred access routes are indicated. The table allows for a relative comparison of 17 siting option combinations.

Since constraint ratings were identical for both parcels of LF-10W, LF-1E and PI-1N, the parcels of these sites are not differentiated in Table 9.

If a high constraint rating were assigned to either the local or regional road segments, the overall route was said to have a major constraint associated with it.

As noted in the discussion of site and access route analysis results, a major constraint rating does not warrant rejection of a particular siting option from further consideration. Rather, assessment during subsequent stages of study would focus on potential impacts and mitigative efforts. A detailed site specific evaluation of the sensitivity of biological resources which had been "flagged" would be made.

Site related conditions are of major concern in assessing siting option constraints and impacts. For example, since on-site construction will involve vegetation clearing, alteration of drainage channels and so on, some level of change is expected to occur. During Phase 3B, off-site impacts were difficult to predict since facility characteristics were only generally known. Potential off-site influences of site development might include: noise, building lighting, and truck traffic.

The access route analysis provided a preliminary comparison of routes to specific facilities and can be used to identify preferred routes to a facility. Since the probability of spills into streams along roads in different geographic regions is not known, access routes were not used to compare siting options.

Summary Of Biological Constraint Ratings Associated With Facility Options And Their Preferred Access Routes

Table 9

SITING OPTION	FACILITY OPTION CONSTRAINT RATING	PREFERRED ACCESS ROUTE(S)	
		Route Description	Constraint Rating
LF-10W	Major	From 403 west on Hwy 2; south on Regional Rd. 22; west on Sawmill Rd. to LF-10W	Minor
LF-11W	Minor	From 403 west on Hwy 2; south on Regional Rd. 22 to LF-11W	No
LF-1E	Major	From QEW west on Regional Rd. 47; south on Regional Rd. 98; west on Carl Rd. to LF-1E	No
LF-3C	Moderate	From QEW south on Regional Rd. 24; west on Hwy 20; south on Regional Rd. 27; west on Elcho Rd. to LF-3C	Major
LF-8C	Minor	From QEW south on Regional Rd. 24; west on Hwy 20; south on Gee Rd.	Major
LF-9C	Minor	From QEW south on Regional Rd. 24; west on Hwy 20 to LF-9C	Major
LF-3E	Major	From QEW west on Regional Rd. 47 to LF-3E	No
LF-4N	Minor	From 401 south on James Snow Parkway; south on Fourth Line to Britannia Rd; west on Britannia Rd. to LF-4N From QEW north on Hwy 25 to Britannia Rd. west; west on Britannia Rd. to LF-4N	Major *
LF-2N/ PI-1A1	No Minor	To PI-1A1 north on Hwy 10; east on Derry Road east; north on Dixie Rd.; east on Steeles Ave.; north on Airport Rd. to PI-1A1 From PI-1A1 to LF-2N south on Airport Rd.; west on Steeles Ave.; south on Dixie Rd.; west on Derry Rd. West	Moderate
LF-2N/ PI-1N	No Minor	To PI-1N north on Hwy 25 to PI 1N or south on James Snow Parkway; south on Fourth Line to Britannia Rd.; west on Britannia Rd. to PI-1N From PI-1N to LF-2N east on Britannia Rd.; north on Fourth Line; north on James Snow Parkway; north on Hwy 10 to PI-1N	Major

* NOTE: Constraints were assessed separately for each route described. Since the constraint rating is the same for all access alternatives within each facility option, whether alternatives to a single site or among facilities, the rating is noted once. LF-1C/PI-1BE is the exception, here the two different ratings are shown.

Summary Of Biological Constraint Ratings Associated With Facility Options And Their Preferred Access Routes

Table 9

SITING OPTION	FACILITY OPTION CONSTRAINT RATING	PREFERRED ACCESS ROUTE(S)	
		Route Description	Constraint Rating
LF-4N/ PI-1N	Minor Minor	To PI-1N north on Hwy 25 to PI-1N or south on James Snow Parkway; south on Fourth Line to Britannia Rd.; west on Britannia Rd. to PI-1N From PI-1N to LF-4N west on Britannia Rd.	Major
LF-1C/ PI-18E	Minor Minor	To PI-18E from Hwy 406 south on Hwy 50; east on Regional Rd. 27; south on Hwy 140 From PI-18E to LF-1C south on Hwy 140; west on Netherby Rd.; west on Townline Rd.; south on Hwy 50; west on Regional Rd. 23; north on O'Reilly's Rd.	Major Minor
LF-10W/ PI-2W	Major Minor	To PI-2W from 403 west on Hwy 2; south on Shaver Rd. From PI-2W to LF-10W west on Hwy 2/53; south on Regional Rd. 22; west on Sawmill Rd.	Minor
LF-11W/ PI-2W	Minor	To PI-2W from 403 west on Hwy 2; south on Shaver Rd. From PI-2W to LF-11W west on Hwy 2/53; south on Regional Rd. 22	No
LF-1E/ PI-27E	Major Major	To PI-27E from QEW west on Regional Rd. 47 to PI-27E From PI-27E to LF-1E east on Regional Rd. 47 to Regional Rd. 98; south on Regional Rd. 98 to Carl Rd.; west on Carl Rd. to LF-1E	No
LF-2N/ PI-13N	No Major	To PI-13N from 401 south on James Snow Parkway; south on Fourth Line to Britannia Rd.; east on Britannia Rd. to Fifth Line; south on Fifth Line or PI-13N from QEW north on Hwy 25 to Britannia Rd.; east on Britannia Rd. to Fifth Line to PI-13N PI-13N to LF-2N north on Fifth Line to Britannia Rd.; west on Britannia Rd. to Fourth Line; north on Fourth Line; north on James Snow Parkway to 401; from 401 north on Hwy 10 to LF-2N	Major

Summary Of Biological Constraint Ratings Associated With Facility Options And Their Preferred Access Routes

Table 9

SITING OPTION	FACILITY OPTION CONSTRAINT RATING	PREFERRED ACCESS ROUTE(S)	
		Route Description	Constraint Rating
LF-4N/ PI-13N	Minor Major	To PI-13N from 401 south on James Snow Parkway; south on Fourth Line to Britannia Rd.; east on Britannia Rd. to Fifth Line; south on Fifth Line or PT-13N from QEW north on Hwy 25 to Britannia Rd.; east on Britannia Rd. to Fifth Line; south on Fifth Line to PI-13N PI-13N to LF-4N north on Fifth Line to Britannia Rd.; west on Britannia Rd. to site	Major

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In Table 9 we present both sites and access route constraint ratings, for convenience. Examination of the site ratings reveals that they can be grouped into three constraint categories: high, moderate and low.

A "high constraint" rating was assigned to those siting options which had a major site constraint. It was reasoned that for such options, there was a possibility of disrupting an important biological resource through site development.

Options falling within the high constraint category are:

LF-10W	LF-10W/PI-2W	LF-4N/PI-13N*
LF-1E	LF-1E/PI-27E	
LF-3E	LF-2N/PI-13N*	

Those options with a major constraint associated with the preferred access route are indicated by an asterisk.

"Moderate constraint" options involved either sites containing a moderate biological constraint or two sites with minor and/or no constraints. Many options in this category involve more than one site and are associated with greater land areas. This fact, plus associated servicing of two sites instead of one, increase the chances of impacting environmental resources.

Options included in the moderate constraint category are:

LF-3C*	LF-4N/PI-1N*
LF-2N/PI-1A1	LF-1C/PI-18E*
LF-2N/PI-1N*	LF-11W/PI-2W

Although it was not used in determining the constraint category, those options with a major constraint assigned to the preferred access route are indicated by an asterisk.

"Low constraint" options were those involving single site (integrated) options with minor constraint ratings. It was reasoned that a low chance of impact could be expected on important biological resources on these sites. The options in this grouping were:

LF-11W
LF-8C*
LF-9C*
LF-4N*

Those options having a major constraint associated with the preferred access route are indicated by an asterisk.

BIOLOGY FACTORS IN IDENTIFICATION OF CANDIDATE SITES

The identification of candidate sites is described in the Phase 3B Site Selection Process report (Dillon, 1984). The eight candidate sites identified are described as well.

During candidate site identification biology factors were given a lower level of importance than factors associated with risks to human health. This is in keeping with the assignment of minimization of risk to human health as the most important goal in the site selection process.

In many cases, biological resources could provide positive attributes in lands surrounding the facilities (buffer zone lands) provided that their value and sensitivity are recognized and mitigation efforts are made to avoid and protect them. Biological resource mapping provides early insight into the distribution of major vegetation units in the vicinity of candidate sites. Such biological resources in buffer zone lands could provide natural screening of the site and at the same time, possible buffer zone land use controls could afford a management and protection mechanism for such wooded areas.

CONCLUSIONS AND RECOMMENDATIONS

Biology factors contributed to the site selection process. By attempting to avoid areas supporting important biological resources, the process has generally fulfilled objectives related to biology factors which are designed to minimize environmental impact.

Discussions with botanical experts substantiated the significance of Carolinian flora in southern Ontario. Occurrence of certain Carolinian trees and shrubs fulfilled an Environmental Significant Area (ESA) criterion -- presence of rare species.

Participants at public participation workshops held in October/November of 1983 indicated that Significant Environmental Units (SEUs) and non-SEU woodlots greater than 20 ha in size should be treated as exclusionary factors.

When faced with the siting option trade-off between small woodlots (local areas of potential environmental significance) and poor agricultural land, participants at a January 1984 public workshop preferred retaining the agricultural land.

The views expressed by the workshop participants support the ranking of SEUs and non-SEUs greater than 20 ha in size as being of greater environmental significance than smaller woodlots.

The impact of developing on or adjacent to biological resources documented in this report will vary according to the special attributes of and/or environmental function served

by the resource and according to the amount of the resource displaced; hence, a true assessment of impact can only be made after site-specific study is completed.

The presence of an SEU or non-SEU woodlot of greater than 20 ha within the acquisition area and/or buffer zone lands of a potential site is not necessarily reason for its exclusion from further consideration. Provided that site design and management is sensitive to forests, they could afford a site benefit through provision of natural screening. Proper management and design strategies could ensure the long-term protection of the biological resource.

It is recommended that biology factors be utilized during Phase 4 of the site selection process, as a means of minimizing impacts on the natural environment. It is further recommended that local scale existing information be retrieved by means of contacts and discussions with local experts, government personnel and interest groups, during Phase 4A (detailed comparative evaluation). Existing information should be confirmed by visits to candidate sites and adjacent lands during Phase 4A.

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	-	Paul Attack, Planning Department
4. Niagara Region	-	Corwin Cambray, Planning Department
	-	Rick Brady, Planning Department
5. Haldimand-Norfolk Region	-	David Roe, Senior Planner, Policy Section
	-	Gordon Miles, Planning Department
6. Hamilton-Wentworth Region	-	Stan Spencer, Director of Environmental Services

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	-	Kathy Lindsay, Biologist, Parks and Recreation Section
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	-	Marg Miller, Wetlands Evaluation Program Officer
	-	Craig Leuty, Director of Operations (now retired)

3. Ministry of Municipal Affairs and Housing (Queen's Park)	-	Basil Gurusinghe, Planner for Halton Region
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	-	Rob Minnes, Planner for Niagara Region
4. Ontario Hydro - Toronto,	-	Lindsay Milton, Route and Site Selection Division

3. FEDERAL GOVERNMENT

1. Canada Centre for Inland Waters, Lands Directorate, Burlington	-	Elizabeth Snell, Lands Information Officer
	-	Daryl Cowell, Lands Information Officer

4. UNIVERSITIES

1. Erindale Campus University of Toronto	-	Dr. P. Maycock
	-	Dr. Ball
2. University of Waterloo	-	Dr. J.K. Morton
3. University of Guelph	-	Dr. J. Ambrose

APPENDICES

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VI - CANDIDATE AREA 17 ADDITIONAL DATA

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CANDIDATE AREA ACCOUNTS

A discussion of the biological resource factors associated with each candidate area is presented in the following pages. On the maps in the map portifolio, all SEUs are numbered in sequence within each candidate area, but non-SEU woodlots are left unnumbered. The names and types of SEUs and the sources of information which support their designation are presented in the text. The distribution of SEUs and non-SEU Woodlots within each candidate area, and the types of SEUs known to occur are discussed briefly according to candidate area number. Candidate areas which occur together on the same map sheet are discussed in the same sections. Those areas which occur on more than one map sheet are discussed under the section for the area upon which the greatest portion occurs.

MAP SHEET NORTH - MAP G-B1

CANDIDATE AREAS 1, 2, 3, 4, 5, 14 AND 15

Candidate Area #1. The only documented SEU within Candidate Area #1 is a tributary of Bronte Creek (Unit 1-I). It flows through the western corner of this candidate area, and has been designated by MNR as a trout/salmon migratory route. Part of one non-SEU Woodlot occurs within the northern part of Candidate Area #1, but most of it lies to the north.

Unit 1-2, occurring outside of but adjacent to the northern boundary, is designated as an ESA, ANSI and AIBR. Unit 1-3 is an area of life science significance outside and adjacent to the western and southern boundaries, respectively.

Candidate Area #2. No SEUs or non-SEU Woodlots occur within Candidate Area #2. An MNR earth science ANSI of provincial significance (Unit 2-1), and an ESA and important area for wildlife habitat (Unit 2-2) occur in the Bronte Creek valley adjacent to the southwestern boundary. Bronte Creek (Unit 1-1), which not only has been designated as a trout/salmon migratory route, but also supports a significant warm water fishery, occurs adjacent to the western boundary of this area. The same tributary designated as a trout/salmon migratory route in Candidate Area #1 flows adjacent to the northwestern boundary. The southern third of one non-SEU Woodlot occurs along the northern boundary of Candidate Area #2.

Candidate Area #3. No SEUs occur in this candidate area. One non-SEU Woodlot, and parts of two others, occur along the southern, western and northern boundaries. Another non-SEU Woodlot lies outside but adjacent to the western boundary of Candidate Area #3.

Candidate Area #4. This candidate area contains no documented SEUs or non-SEU Woodlots. The Credit River and valley (Unit 4-1), which supports a significant warm water fishery at this point, and which provides a significant wildlife corridor, occurs near the western boundary. Three areas designated as ESAs (Units 4-2, 4-3 and 4-4) occur outside of but adjacent to the northern and southern boundaries of Candidate Area #4. Units 4-3 and 4-4 have been identified by MNR as locally important upland habitat for wildlife, and as a regionally significant life science area, respectively. Another area (Unit 4-5), occurring adjacent to the eastern boundary of Candidate Area #4, has been identified by MNR as locally important upland habitat for wildlife. Adjacent to the southern boundary within the valley of the Credit River, two sites of provincial earth science significance (Units 4-6

and 4-7) and one area of local earth science significance (Unit 4-8), occur. The southern sections of the Credit River serve as a trout/salmon migratory route, but these species do not migrate this far upstream. There are no non-SEU Woodlots adjacent to Candidate Area #4.

Candidate Area #5. Three tributaries of Oakville (Sixteen Mile) Creek (Unit 5-1), identified by MNR as trout/salmon migratory routes, flow through and adjacent to the eastern half of this candidate area. A complex SEU (Unit 5-2) occurs within the eastern half of Candidate Area #5, and along the southern and western boundaries of it: Some sections of Unit 5-2 have been designated as an ESA, and others have been identified by MNR as provincially significant from a life science standpoint, and as important wildlife habitat. For the most part, Unit 5-1 is restricted to the river valley of Oakville (Sixteen Mile) Creek. Two non-SEU Woodlots occur totally within this candidate area and parts of three others occur in the eastern third of the area. One occurs adjacent to the western boundary, and another along the eastern boundary.

No SEUs occur outside of but within the 1 km distance of the boundaries of Candidate Area #5. Two non-SEU Woodlots, however, do occur outside the boundaries at the northern lobe and at the southern end.

Candidate Area #14. Candidate Area #14 contains no SEUs or non-SEU Woodlots. One ESA and ANSI (Unit 14-1) and one ESA (Unit 4-4), however, occur adjacent to the western boundary. The latter, Unit 4-4, is also a provincially significant ANSI. Immediately to the west of these two ESAs is the Credit River (Unit 4-1). It supports a significant warm water fishery, and its valley provides wildlife habitat which is locally significant. No non-SEU Woodlots occur adjacent to the boundaries of Candidate Area #14.

Candidate Area #15. There are no SEUs or non-SEU Woodlots within this candidate area. Oakville (Sixteen Mile) Creek and its valley (Unit 5-2) occur adjacent to the southeastern boundary. Unit 5-2 is an ESA, and contains wildlife habitat of local significance. A section adjacent to the boundary of Candidate Area #15 has also been identified as regionally significant from a life science viewpoint. There are no non-SEU Woodlots adjacent to the boundaries of Candidate Area #15..

MAP SHEET WEST - MAP G-B2

CANDIDATE AREAS 6, 7, 16 AND 17

Candidate Area #6. There is only one SEU within Candidate Area #6. Unit 6-1, recognized as a provincial ANSI of life science significance, occurs in the west central section of Candidate Area #6. Four non-SEU Woodlots occur within the candidate area in the west central part, and along the north and southeast boundaries.

Unit 6-2 occurs adjacent to the northeastern boundary, and is a provincial ANSI of earth science significance. A single non-SEU Woodlot occurs adjacent to the southeastern boundary. These are widely scattered among mainly farm lands.

Candidate Area #7. Three SEUs have been designated as ESAs: Unit 7-1 and 7-17 occur near the northern boundary; and Unit 7-8 occurs in the central portion near the Grand River. Unit 7-8 is also designated as an ESA within the Haldimand-Norfolk Official Plan. The Grand River (Unit 7-10) flows through Candidate Area #7 near the eastern and northern boundary, and because it supports a warm water fishery and bait fishery throughout, is considered an AIBR. A vast section of the Grand River floodplain along the eastern boundary and in the southeast corner (Unit 7-15) is significant in a local context because it provides wildlife habitat.

A portion near the southern boundary of Candidate Area #7 is provincially significant because of the presence of several riverside landform features. Unit 7-12 has been identified by MNR as a provincially significant earth science site because it is a good example of a glacial lake shoreline. Unit 7-12 occurs in the southwestern corner of Candidate Area #7. Another eight areas (Units 7-2, 7-3, 7-4 to 7-7, 7-9, 7-11), which have biological significance, occur within Candidate Area #7.

A total of five SEUs occur within a 1 km distance of the boundaries of Candidate Area #7. One ESA (Unit 7-16), containing an area of significant earth science features, occurs outside of but adjacent to the southern boundary of a separate section of Candidate Area #7 south of the Six Nations Indian Reserve 40. It contains an area of local earth science significance, and has been designated as an ESA in the Official Plan of the Regional Municipality of Haldimand-Norfolk. Unit 7-14 possesses significant earth science features, and occurs outside of this candidate area along the Grand River in the central part. Unit 17-1 occurs at the extreme southeastern boundary and possesses significant life science features. Sixteen non-SEU Woodlots occur outside the boundaries of this candidate area. Nine of these occur adjacent to the largest portion of Candidate Area #7, while seven occur adjacent to the two smaller portions which occur to the south and west of the Six Nations Indian Reserve 40. These non-SEU Woodlots occur as vast blocks of forested and wetland areas, and form an extensive east/west corridor for wildlife habitat. They are segmented by farmland and small residential areas.

Candidate Area #16. Four SEUs occur within Candidate Area #16. Unit 16-1 is an ESA and ANSI. Unit 16-1 is found at the western boundary, and exists in two segments. The largest segment lies immediately west of the boundary. One ANSI (Unit 16-2) occurs in the north central portion of Candidate Area #16. Two SEUs, both marginal ESAs, occur in the southern portion of the candidate area. One extends into candidate area #7. Boundaries are very approximate. The non-SEU Woodlots are widely scattered throughout this candidate area.

One ESA (Unit 7-1) occurs adjacent to the southcentral boundary. The Grand River (Unit 7-10), which supports a warm water fishery, flows along the southwestern border of this candidate area. Another (Unit 6-1) occurs adjacent to the northern boundary. One non-SEU woodlot occurs adjacent to the southern boundary.

Candidate Area #17. One SEU (Unit 17-1) and eight non-SEU Woodlots occur within Candidate Area #17. This SEU is an ANSI, and is located in and outside the southwestern corner. Five of the eight non-SEU Woodlots occur at or along the western boundary, while the other three occur along the southeastern and eastern boundaries.

Two SEUs occur within a 1 km distance of the boundaries of Candidate Area #17. Lake Niapenco (Unit 8-1), a significant recreational fishing area, occurs adjacent to this candidate area's northern boundary. Unit 7-4, an area of life science significance, occurs at the western boundary. Twelve non-SEU Woodlots occur adjacent to the west, south, and southeast boundaries. Many of these are larger than 20 ha, and occur in lowland areas. Although separated mainly by farmland, these woodlots form the eastern portion of a very dense pattern of forested area which occurs

mostly on the Six Nations Indian Reserve 40 to the south and west of Candidate Area #7.

MAP SHEET CENTRAL - MAP G-B3

CANDIDATE AREAS 8, 9, 10, 11 AND 18

Candidate Area #8. Candidate Area #8 contains all or parts of 12 SEUs and 53 non-SEU Woodlots. Seven of these SEUs are ESAs (Units 8-4 to 8-9 and 8-12). They occur at or adjacent to the north and east boundaries, and within the central part. The two central ESAs (Units 8-4 and 8-9) contain sections which are provincially significant forested areas. In addition, Unit 8-4 has been given policy status as an ESA in the approved Offical Plan of the Regional Municipality of Hamilton-Wentworth. Lake Niapenco (Unit 8-1), which occurs in the northeast corner, provides recreational fishing opportunities for warm water species, provides important wildlife habitat, and is a wildlife management area. The Welland River flows from Lake Niapenco diagonally through this candidate area to its southeast corner, but the river has not been identified as containing a significant warm water fishery within Candidate Area #8. Four ANSIs of biological significance (Units 8-2, 8-3, 8-10 and 8-11) occur within Candidate Area #8. Unit 8-15 is an ANSI which is completely contained within the Unit 8-9, an ESA and ANSI. Unit 8-15 has been shown separately because of a change in boundary subsequent to re-evaluation of ANSI boundary of Unit 8-9.

Five SEUs and 11 non-SEU Woodlots occur outside of but within 1 km of the boundaries of Candidate Area #8. Unit 8-14, a provincially significant area, occurs to the south of the southern boundary of this candidate area. Another ANSI (Unit 8-13) occurs adjacent to the southern boundary. Two ESAs (Units 18-1 and 18-6) and one ANSI (Unit 18-10) occur outside the northern and eastern boundaries of Candidate Area #8. The 11 non-SEU Woodlots are located in mainly lowland and stream valley areas, and are distributed throughout Candidate

Area #8 except in the northwest corner. Woodlots, in conjunction with the ESAs and provincially significant areas within this candidate area, and four other ESAs which occur adjacent to the north and east boundaries, form a dense pattern of forested area in this part of the Niagara Peninsula. These forested areas are separated mainly by farmland.

Candidate Area #9. Candidate Area #9 contains 3 SEUs and 25 non-SEU Woodlots. A portion of these three SEUs (Units 9-1 to 9-3), which are all ESAs, occur along the northern boundary in the west corner and along the southern boundary in the central and eastern sections. ANSIs occur within this candidate area as life science sites within Units 9-1 and 9-2. The non-SEU Woodlots are scattered throughout the candidate area, but are concentrated in the central portion and at the eastern end.

Thirteen SEUs and 11 non-SEU Woodlots occur within 1 km of the boundaries of Candidate Area #9. Ten of the 13 SEUs are ESAs. Five ESAs (Units 9-4 to 9-7 and 10-6) occur adjacent to the western and central portion at the northern boundary, and five others (Units 18-1 to 18-5) occur in the central and eastern portion within 1 km of the southern boundary. Of these 10 ESAs, two (Units 9-5 and 9-6) are designated in the approved Official Plan of the Regional Municipality of Hamilton-Wentworth, and of Niagara, respectively. Three ANSIs, one an earth science site (Unit 9-8) and two life science sites (Units 10-8, also an ESA, and 10-9) occur adjacent to the northern boundary of this candidate area. The 11 non-SEU Woodlots occur mostly in the central and eastern sections, and are separated mainly by farmland. All of these woodlots, together with the ESAs within and adjacent

to the boundaries, form a moderately dense block of forested area, which in several sections provides forested east/west corridors.

Candidate Area #10. Four SEUs and eight non-SEU Woodlots occur within Candidate Area #10. All four SEUs are ESAs. Two (Units 10-1 and 10-2) occur at the northern boundary in the western half of the area, and the other two (Units 10-3 and 10-4) occur along the southern boundary. The eight non-SEU Woodlots are scattered throughout the candidate area, with seven of the eight occurring in the central and western sections.

Five SEUs occur within 1 km of the boundary of Candidate Area #10. Two are ESAs and occur at the southern boundary (Units 10-6 and 10-8). The other three SEUs are ANSIs (Units 10-5, 10-7 and 10-9), and occur adjacent to the northern and southern boundaries. Two other ANSIs occur near the southern boundary within ESA Unit 10-8. Three non-SEU Woodlots occur adjacent to the boundary at the extreme eastern lobe. These woodlots, in association with the ESAs, provide an east/west corridor of forested areas which are often widely separated by farmland.

Candidate Area #11. Candidate Area #11 contains only one SEU (Unit 11-1) and an isolated non-SEU Woodlot. Unit 11-1, and ESA, occurs in the northern corner, and the non-SEU Woodlot, in the southwest corner. An extensive ESA wetland (Unit 12-1) occurs outside of but adjacent to the southeast boundary. These ESAs and woodlot, together with others to the west and north, form a pattern of forested areas segmented mainly by farmland.

Candidate Area #18. Candidate Area #18 contains 38 SEUs and 57 non-SEU Woodlots.. Thirty-four of the 38 SEUs are ESAs (Units 18-1 to 18-9, 18-11 to 18-28, 8-5, 8-8, 8-12, 9-2 9-3, 11-1 and 12-1). These are distributed throughout the candidate area except in the extreme west corner and the central region. One of these ESAs, Unit 18-4, contains a provincially significant forested area. A section of the Welland River (Unit 18-11), which maintains a significant warm water fishery, flows through the southern half of this area. Twenty-nine ANSIs occur within Candidate Area #18, and an additional three occur near the boundaries. All but 3 of these 32 ANSIs (Units 18-29 to 18-31) occur within areas identified as ESAs.

Six ESAs (Units 8-6, 8-7, 18-32 to 18-35), one ANSI and AIBR (Unit 8-1), and one ANSI (Unit 8-11) occur outside of but adjacent to the south and east boundaries of this candidate area. Eighteen non-SEU Woodlots occur outside of but adjacent to the boundaries. These are scattered evenly throughout, and mainly in areas with low relief and in stream valleys. The 75 woodlots, together with 41 ESAs, form a moderately dense pattern of forested areas. Sections of these forested areas are separated mainly by farmland. Because of their size and numbers, the woodlots and ESAs form an integral part of the overall pattern of forested area in the Niagara Peninsula.

MAP SHEET EAST - MAP G-B4

CANDIDATE AREAS 12, 13 AND 19

Candidate Area #12. Candidate Area #12 contains three SEUs. Unit 12-1 which occurs in the extreme southeast corner has been identified as an extensive ESA. It has also been

designated as an ESA in the approved Official Plan of the Regional Municipality of Niagara. Unit 12-1 has also been designated as an AIBR, and additionally, it includes an ANSI that is provincially significant. The greater part of Unit 12-1 occurs south of the candidate area. One area identified by MNR as being of life science significance occurs within the central portion of Candidate Area #12 (Unit 12-2). A small portion of Unit 18-27 occurs in the north-western corner of this candidate area. Two non-SEU Woodlots are located in Candidate Area #12. One occurs in the central region, and another along the eastern boundary.

No SEUs occur within the 1 km distance of the candidate area boundaries; however, one non-SEU woodlot occurs at the northern boundary. These ESAs and woodlots are widely scattered, but contribute to an extensive but fragmented pattern of forested areas separated by residential areas and farmlands in the south central portion of the Niagara Peninsula.

Candidate Area #13. This candidate area contains 14 SEUs and 18 non-SEU Woodlots. Of the 14 SEUs, 12 are ESAs. Four of these ESAs (Units 13-1 to 13-4) occur along this candidate area's northern boundary. Unit 13-8 is an ESA approved in the Official Plan, and is an AIBR containing an ANSI. This unit occurs as a large area in the central portion of Candidate Area #13. Units 13-10 to 13-14 are ESAs which occur along the eastern and southern boundaries of this candidate area. The AIBRs associated with Candidate

Area #13 include the Welland River (Unit 13-5), Lyons Creek (Unit 13-6), and Ussher's Creek (Unit 13-7). All support a significant warm water fishery, and flow through the northern half of this candidate area. The Lyons Creek floodplain (Unit 19-4) has been identified as a locally important wetland area. An extensive tract of forest and wetland (Unit 13-8) has been identified by MNR as a wildlife management area and is designated in the Policy Plan of the Niagara Region. A section of Unit 13-8 along the western boundary of this candidate area is also provincially significant. The non-SEU Woodlots are distributed throughout Candidate Area #13, and occur mainly as separated areas rather than as a forested block.

Ten SEUs occur outside of but adjacent to the boundaries of this candidate area. Five ESAs (Units 13-15, 13-16, 13-18, 13-21 and 13-23) occur outside of but adjacent to the western, northern and eastern boundaries of Candidate Area #13. Six ANSIs (Units 13-9, 13-19, 13-22 and parts of the ESA Units 13-16, 13-14 and 13-23) occur outside of the boundary along the Niagara River, and adjacent to the southern boundary. Portions of SEU 13-14 are designated in the Policy Plan of Niagara Region. SEUs 13-9, 13-19, 13-22 and 13-20 have been identified as important bait fishery areas by MNR. The Niagara River (Unit 13-17) supports a significant warm water fishery, and is a significant trout/salmon migratory route. Its shoreline also provides significant waterfowl habitat. The Black Creek area extending westward beyond the Candidate Area has been identified in the Policy Plan of Niagara Region as an approved ESA. Four non-SEU Woodlots occur adjacent to the boundaries of Candidate Area #13. Woodlots, within and adjacent to the boundaries of this candidate area, produce a block of forested areas which is segmented mainly by farmland.

Candidate Area #19. Candidate Area #19 contains eight SEUs, all of which are ESAs (Units 19-1 to 19-6, 13-6, 13-8). Four of these (Units 19-4 to 19-6, 13-8) are identified in the Policy Plan of Niagara as approved ESAs. Parts of Units 19-5 and 13-8 are considered ANSIs. Two areas (Unit 19-4 and part of Unit 13-8) are provincially significant wetland and forested areas, respectively. The Welland River (Unit 13-5), which supports a significant warm water fishery in this area, flows adjacent to and within the north boundary of Candidate Area #19. Lyons Creek (Unit 13-6) and Lyons Creek Floodplain Wetland (Unit 19-4) are approved ESAs which support a significant warm water fishery, and wildlife habitat. An extensive tract of land (Unit 13-8), identified as an ESA, a significant wildlife habitat area (AIBR), and a provincially significant forested area (ANSI), occurs along and adjacent to the southeastern boundary of Candidate Area #19. Three non-SEU Woodlots occur within Candidate Area #19, and are widely scattered.

No SEUs occur within 1 km of the boundaries, but three non-SEU Woodlots occur adjacent to the northern and western boundaries. The SEUs and non-SEU Woodlots, both within and adjacent to the boundaries, together form a dense block of wetland and forested areas that is segmented mainly by farmland. The SEUs and Woodlots are distributed roughly evenly throughout Candidate Area #19.

Claireville Candidate Area

There are no SEUs either within the boundaries of, or adjacent to the boundaries of the Candidate Area #19 as indicated in MTRCA (1982) and Ontario Ministry of Natural Resources (1983a, 1983b). Three non-SEU Woodlots occur

within this area at the extreme northwest and the south-eastern end. These account for 6% of the total Claireville area. Two additional non-SEU Woodlots occur within 1 km of the boundary; one along the northern boundary, and the second along the southern boundary. Much of the wooded area is located along the stream valley walls.

APPENDIX II

SITE AREAS REJECTED DURING IDENTIFICATION OF POTENTIAL SITES

(THOSE WITH SEUs PRESENT)

Table 11

CHARACTERISTICS OF SEUs ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
LF-13W	17-1	North Cayuga Slough Forest		extensive forested wetland, diverse habitat, regionally rare flora	OMNR, 1983a (20) MacDonald, 1980 (60)
LF-1C	18-25	Tunacliffe Road Woodlot	water storage for tributary to Little Forkes Creek	rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (WF 08) *
	18-27	Farr's Road Woodlot		rare species; Swamp White Oak and Pin Oak (Argus and White, 1977)	Brady et al., 1980 (WF 09)
LF-4C	18-27	" " "		" " "	" " "
LF-5C	18-27	" " "		" " " "	" " "
LF-6C	18-13	Henderson Road Woodlot	hydrologic flow contribution to Forkes Creek and Welland River	rare species; Swamp White Oak, Pignut Hickory and Black Walnut (Argus and White, 1977)	Brady et al., 1980 (WF 03) OMNR, 1983a (29)
LF-7C	18-9	Comfort's Bush	source for Fifteen Mile Creek and a tributary of the Welland River	high quality biological community high biological diversity,rare species; Pin Oak, Black Gum, Eastern Flowering Dogwood (Argus and White, 1977)	Brady et al., 1980 (WL 20) OMNR, 1983a (28)
LF-8C	18-8	Davison's Bush	water discharge to Fifteen Mile Creek and Welland River	high quality waterfowl habitat	Brady et al., 1980 (WL 19) OMNR, 1983a (28)
LF-10C	18-5	Sucker Creek	headwater to Sucker Creek,water discharge to Fifteen and Sixteen Mile Creeks	high biological diversity,rare species; Swamp White Oak (Argus and White, 1977) high quality communities	Brady et al., 1980 (WL 09)
	18-8	Davison's Bush	water discharge to Fifteen Mile Creek and Welland River	high quality waterfowl habitat	Brady et al., 1980 (WL 19) OMNR, 1983a (28)
LF-12C	9-2	Caistor Centre East	water storage for local streams	high biological diversity,rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 04) OMNR, 1983a (20)
LF-13C	9-2	" " "	" " " " "	" " " "	" " "

* Numbers in brackets after source title indicate report page number on which data appears

Table 11

CHARACTERISTICS OF SEUs ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
LF-14C	18-8	Vachon Bush		game bird habitat,rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (WF 11)
LF-15C	18-14	Perry Road Woodlot	water storage for Little Forkes and Forkes Creeks	rare species; Swamp White Oak, Honey-locust, Chinquapin Oak (Argus and White, 1977)	Brady et al., 1980 (WF 04) OMNR, 1983a (29)
	18-15	Skrubbeltrang Woodlot		rare species; Swamp White Oak Pignut Hickory (Argus and White, 1977)	Brady et al., 1980 (WF 06)
	18-16	Elsie Road Woodlot	water storage area for Welland River and Forkes Creek	wildlife habitat,rare species; Pin Oak, Swamp White Oak, Pignut Hickory	Brady et al., 1980 (WF 05) OMNR, 1983a (29)
	18-30	un-named (ANSI)		possible regionally representative forest	OMNR 1983a (29) MacDonald, 1980 (186)
	18-31	un-named (ANSI)	unknown	unknown	OMNR 1983a (29)
LF-17C	18-7	Bismarck Bush	water discharge to Parker's Creek tributaries	high quality woodlot, educational value, rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 14) OMNR, 1983a (20)
LF-19C	18-3	Hardy's Wood	headwater to Parker's Creek	high habitat diversity, scientific research and educational value rare species; Black Gum, Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 07) OMNR, 1983a (20)
	18-4	Silverdale Bush	headwater tributary to Sixteen Mile Creek, Welland River	wildlife habitat diverse biological communities large: 300 hectares rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 08) OMNR, 1983a (28)
	18-7	Bismarck Bush	water discharge to Parker's Creek tributaries	high quality woodlot educational value rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 14) OMNR, 1983a (20)

Table 11

CHARACTERISTICS OF SEUs ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
LF-20C	18-4	Silverdale Bush	headwater tributary to Sixteen Mile Creek, Welland River	wildlife habitat diverse biological communities large (300 hectares) rare species: Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 08) OMNR, 1983a (28)
	18-5	Sucker Creek	headwater to Sucker Creek, water discharge to Fifteen and Sixteen Mile Creeks	high biological diversity rare species; Swamp White Oak (Argus and White, 1977) high quality communities	Brady et al., 1980 (WL 09)
	9-3	Hafeman's Bush	headwater to Fifteen and Sixteen Mile Creeks	wildlife habitat habitat diversity rare species; Swamp White Oak and Pignut Hickory (Argus and White, 1977)	Brady et al., 1980 (WL 10)
LF-21C	18-6	Pot's Woodlot	water storage for Beaver Creek	diverse biological community rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 13)
	18-2	Garber's Grove	water storage for Twenty Mile Creek and Welland River	high quality plant and animal communities diverse biological communities rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 15) OMNR, 1983a (20)
	8-8	Vaughan Forest		high quality biological community (mature trees) rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 12) OMNR, 1983a (20)
LF-22C	18-2	Garber's Grove	water storage for Twenty Mile Creek and Welland River	high quality plant and animal communities diverse biological communities rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 15) OMNR, 1983a (20)
	18-3	Hardy's Wood	headwater to Parker's Creek	high habitat diversity scientific research and educational value rare species; Black Gum, Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 07) OMNR, 1983a (20)

Table II

CHARACTERISTICS OF SEUs ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
	18-6	Pot's Woodlot	water storage for Beaver Creek	diverse biological community rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 13)
LF-23C	18-4	Silverdale Bush	headwater tributary to Sixteen Mile Creek, Welland River	wildlife habitat diverse biological communities large (300 hectares) rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 08) OMNR, 1983a (28)
LF-26C	18-1	Caistor Bush		high biological community diversity rare species; Swamp White Oak, Black Gum (Argus and White, 1977)	Brady et al., 1980 (WL 02)
LF-27C	18-1	Caistor Bush		high biological community diversity rare species; Swamp White Oak, Black Gum (Argus and White, 1977)	Brady et al., 1980 (WL 02)
LF-28C	8-5	Inverary Woods	headwater to Mill Creek	high quality community rare species; Wild Plum, Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 01) OMNR, 1983a (20)
LF-3E	19-28	Babion Road Woodlot		rare species; Swamp White Oak, Pin Oak, Chinquapin Oak, Big Shellbark Hickory (Argus and White, 1977)	Brady et al., 1980 (PC 01)
LF-4E	19-5	Yokom Woodlot	headwater to Tea and Lyons Creeks	rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (MF 09) OMNR, 1983a (29)
	19-6	Old Lincoln Street Woodlot	storage and recharge to tributary to Tea Creek	rare species; Black Gum, Black Oak, Pin Oak, Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (MF 10)
LF-5E	19-6	Old Lincoln Street Woodlot	storage and recharge to tributary to Tea Creek	rare species; Black Gum, Black Oak, Pin Oak, Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (MF 10)

Table____

CHARACTERISTICS OF SEU s ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
LF-6E	18-29	Salina Formation		example of geological formation	OMNR, 1983a (28)
LF-9E	13-8	Willoughby Marsh	water storage and recharge for numerous creeks	wildlife habitat representative remnant wetland feature rare species; Black Gum, Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977) marsh is large (592 ha)	Brady et al., 1980 (WF 11) OMNR, 1983 a, d (28, 29) Regional Municipality of Niagara, 1981
LF-10E	19-1	McKenney Road Woodlot		rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (WE 01)
LF-11E	18-26	Highland Woodlot	headwaters of tributaries to Welland River	rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (PL 08) OMNR, 1983a (29)
LF-12E	13-8	Willoughby Marsh	water storage and recharge for numerous creeks	wildlife habitat representative remnant wetland feature rare species; Black Gum, Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977) marsh is large (592 ha)	Brady et al., 1980 (WF 11) OMNR, 1983 a, d (28, 29) Regional Municipality of Niagara, 1981
	19-4	Lyons Creek, Floodplain Wetland		diverse wetland community	OMNR 1983 a, d (28, 29)
FE-2W	6-1	South Cuff's Corner Forest	unknown	unknown	OMNR, 1983a (12) MacDonald, 1980 (256)
FE-3W	7-1	Green's Road Woods		rare species; Black Walnut, Wild Plum (Argus and White, 1977) and 13 plants rare in Brant County also occurrence of Fowler's Toad	Eagles, 1980 (180) OMNR, 1983a (12)
FE-2E	8-7	McCready's Bush	headwater for tributaries to Welland River	wildlife habitat diversity of biological communities nesting Turkey Vulture rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WF 05) OMNR, 1983a (20)

Table II

CHARACTERISTICS OF SEU's ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
PI-3C	IB-15	Shrubbeltrang Woodlot		rare species; Swamp White Oak, Pignut Hickory (Argus and White, 1977)	Brady et al., 1980 (WF 06)
	IB-16	Elsie Road Woodlot	water storage area for Welland River and Forkes Creek	wildlife habitat rare species; Pin Oak, Swamp White Oak, Pignut Hickory (Argus and White, 1977)	Brady et al., 1980 (WF 05) OMNR, 1983a (29)
PI-4C	B-6	Moore's Creek	recharge for Moore's and Mill Creeks .	high diversity of biological communities rare species; Swamp White Oak (Argus and White, 1977) nesting Turkey Vulture	Brady et al., 1980 (ML 03) OMNR, 1983a (20)
	IB-1	Colstor Bush		high biological community diversity rare species; Swamp White Oak, Black Gum (Argus and White, 1977)	Brady et al., 1980 (ML 02)
PI-5C	B-5	Invorary Woods	headwater to Mill Creek	high quality community rare species; Wild Plum, Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (ML 01) OMNR, 1983a (20)
PI-6C	9-2	Colstor Centre East	water storage for local streams	high biological diversity rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (ML 04) OMNR, 1983a (20)
PI-7C	9-2	" " "	" " " " "	" " " "	" " "
PI-8C	B-8	Vaughan Forest		high quality biological community (mature trees) rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (ML 12) OMNR, 1983a (20)
PI-9C	IB-2	Garber's Grove	water storage for Twenty Mile Creek and Welland River	high quality plant and animal communities diverse biological communities rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (ML 15) OMNR, 1983a (20)

Table II

CHARACTERISTICS OF SEU's ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
PI-10C	10-4	Silverdale Bush	headwater tributary to Sixteen Mile Creek, Welland River	wildlife habitat diverse biological communities large; 300 hectares rare species; Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 08) OMNR, 1983a (28)
PI-11C	10-4	" "	" " "	" " "	" " "
PI-12C	10-8	Davison's Bush	water discharge to Fifteen Mile Creek and Welland River	high quality waterfowl habitat	Brady et al., 1980 (WL 19) OMNR, 1983a (28)
PI-13C	10-9	Comfort's Bush	source for Fifteen Mile Creek and a tributary of the Welland River	high quality biological community high biological diversity rare species; Pin Oak, Black Gum, Eastern Flowering Dogwood (Argus and White, 1977)	Brady et al., 1980 (WL 20) OMNR, 1983a (28)
PI-14C	10-12	Yachon Bush		game bird habitat rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (WF 11)
PI-15C	10-25	Tunacliffe Road Woodlot	water storage for tributary to Little Forkes Creek	rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (WF 08)
	10-27	Farr's Road Woodlot		rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (WF 09)
PI-17C	10-27	Farr's Road Woodlot		rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (WF 09)
PI-19C	8-5	Tonerary Woods	headwater to Mill Creek	high quality community rare species; Wild Plum, Swamp White Oak (Argus and White, 1977	Brady et al., 1980 (WL 01) OMNR, 1983a (20)

Table II

CHARACTERISTICS OF SEUs ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
PI-19C	8-5	Inverary Woods	headwater to Mill Creek	high quality community rare species; Wild Plum, Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (WL 01) OMNR 1983a (20)
PI-20C	18-1	Caistor Bush		high biological community diversity rare species; Swamp White Oak, Black Gum (Argus and White, 1977)	Brady et al., 1980 (WL 02)
PI-23C	18-5	Sucker Creek	headwater to Sucker Creek discharge to Fifteen and Sixteen Mile Creeks	high biological diversity rare species; Swamp White Oak (Argus and White, 1977) high quality communities	Brady et al., 1980 (WL 09)
PI-24C	18-14	Perry Road Woodlot	water storage for Little Forkes and Forkes Creeks	rare species; Swamp White Oak Honey-locust, Chinquapin Oak (Argus and White, 1977)	Brady et al., 1980 (WF 04) OMNR, 1983a (29)
PI-1E	13-3	Ramsey Road Woodlot		rare species; Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977)	Brady et al., 1980 (NF 04)
PI-2E	13-3	Ramsey Road Woodlot		rare species; Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977)	Brady et al., 1980 (NF 04)
PI-3E	13-2	Cyanamid Corners	recharge to Welland River and Thompson Creek	diversity of biological communities rare species; Swamp White Oak, Black Walnut, Chinquapin Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (NF 02)
PI-4E	13-2	Cyanamid Corners	recharge to Welland River and Thompson Creek	diversity of biological communities rare species; Swamp White Oak, Black Walnut, Chinquapin Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (NF 02)

Table 11

CHARACTERISTICS OF SEU's ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
PI-5E	13-1	Polloway Bush	water storage for tributary to Thompson Creek	rare species; Pin Oak, Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (TH 01)
PI-6E	19-2	Horse Track Woodlot		rare species; Swamp White Oak, Eastern Flowering Dogwood, Pignut Hickory, Chinquapin Oak (Argus and White, 1977) Black Oak (Kershaw, Morton and Venn, 1976)	Brady et al., 1980 (NF 07)
PI-7E	19-2	Horse Track Woodlot		rare species; Swamp White Oak, Eastern Flowering Dogwood Pignut Hickory, Chinquapin Oak, (Argus and White, 1977) Black Oak (Kershaw, Morton and Venn, 1976)	Brady et al., 1980 (NF 07)
	19-4	Lyons Creek Floodplain Wetland		diverse wetland community	OMNR, 1983a (28, 29)
PI-9E	13-8	Willoughby Marsh	water storage and recharge for numerous creeks	wildlife habitat representative remnant wetland feature rare species; Black Gum, Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977) marsh is large (592 ha)	Brady et al., 1980 (NF 11) OMNR, 1983 a, d (28, 29) Regional Municipality of Niagara, 1981
PI-13E	13-13	Beaver Creek	recharge area	recreational use rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (FE 04)
	13-12	Summer Street Woodlot	maintenance function for Miller and Baker Creeks	high quality animal community rare species; Swamp White Oak, Pin Oak (Argus and White, 1977) scientific research and conservation education benefits high aesthetic value	Brady et al., 1980 (FE 05)
PI-14E	13-13	Beaver Creek	recharge area	recreational use rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (FE 04)

Table 11

CHARACTERISTICS OF SEU's ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
PI-16E	I3-13	Beaver Creek	recharge area	recreational use rare species: Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (FE 04)
PI-18E	18-29	Salina Formation		example of geological formation	OMNR, 1983a (28)
PI-21E	18-28	Babion Road Woodlot		rare species; Swamp White Oak, Pin Oak, Chinquapin Oak, Big Shellbark Hickory (Argus and White, 1977)	Brady et al., 1980 (PC 01)
PI-23E	13-11	Waverly Woodlot		rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (NF 01)
PI-24E	13-10	Boyer's Creek Bush		rare species; Black Gum, Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977)	Brady et al., 1980 (NF 13) OMNR, 1983a (29)
PI-25E	13-8	Willoughby Marsh	water storage and recharge for numerous creeks	wildlife habitat, representative remnant wetland feature rare species; Black Gum, Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977) marsh is large (592 ha)	Brady et al., 1980 (NF 11) OMNR, 1983 a, d (28, 29) Regional Municipality of Niagara, 1981
PI-26E	19-2	Horse Track Woodlot		rare species; Swamp White Oak, Eastern Flowering Dogwood, Pignut Hickory, Chinquapin Oak (Argus and White, 1977) Black Oak (Kershaw, Morton and Vann, 1976)	Brady et al., 1980 (NF 07)

Table II

CHARACTERISTICS OF SEUs ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
PI-26E (cont'd)	19-3	Young Woodlot		rare species; Pignut Hickory, Swamp White Oak (Argus and White, 1977)	Brady et al., 1980 (NF 08)
PI-29E	13-8	Willoughby Marsh	water storage and recharge for numerous creeks	wildlife habitat representative remnant wetland feature rare species; Black Gum, Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977) marsh is large (592 ha)	Brady et al., 1980 (NF 11) OMNR, 1983 a, d (28, 29) Regional Municipality of Niagara, 1981
PI-30E	19-1	McKenney Road Woodlot		rare species; Swamp White Oak, Pin Oak, (Argus and White, 1977)	Brady et al., 1980 (WE 01)
PI-31E	13-14	Fox Street Woodlot		rare species; Eastern Flowering Dogwood, Swamp White Oak, Honey-locust, Pin Oak (Argus and White, 1977) aesthetic value	Brady et al., 1980 (FE 03) OMNR, 1983a (29)
PI-32E	13-8	Willoughby Marsh	water storage and recharge for numerous creeks	wildlife habitat representative remnant wetland feature rare species; Black Gum, Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977) marsh is large (592 ha)	Brady et al., 1980 (NF 11) OMNR, 1983a, d (28, 29) Regional Municipality of Niagara, 1981
PI-33E	19-5	Yokom Woodlot	headwater to Tea and Lyons Creeks	rare species; Swamp White Oak, Pin Oak (Argus and White, 1977)	Brady et al., 1980 (NF 09) OMNR, 1983a (29)

Table II

CHARACTERISTICS OF SEUs ON OR IMMEDIATELY ADJACENT TO ELIMINATED SITE AREAS

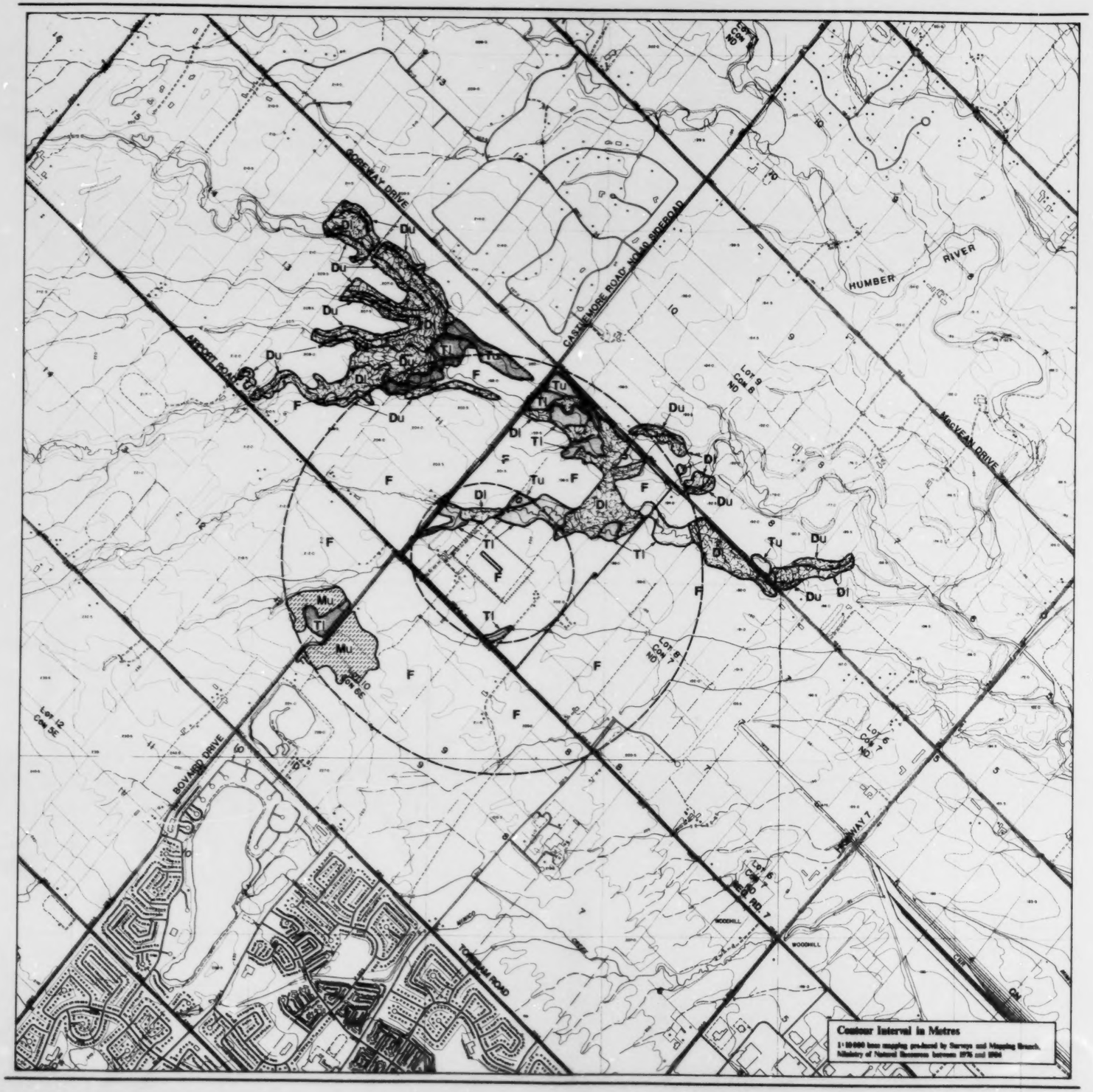
SITE AREA	SEU		CHARACTERISTICS OF SEUs		INFORMATION SOURCE
	NUMBER	NAME	ENVIRONMENTAL FUNCTION	SPECIAL ATTRIBUTE	
PI-33E (cont'd)	19-6	Old Lincoln Street Woodlot	storage and recharge to tributary to Tee Creek	rare species; Black Gum, Pin Oak Swamp White Oak (Argus and White, 1977) Black Oak (Kershaw, Morton and Venn, 1976)	Brady et al., 1980 (NF 10)
	13-8	Willoughby Marsh	water storage and recharge for numerous creeks	wildlife habitat representative remnant wetland feature rare species; Black Gum, Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977) marsh is large (592 ha)	Brady et al., 1980 (NF 11) OMNR, 1983 a, d (28, 29) Regional Municipality of Niagara, 1981
PI-35E	18-26	Highland Woodlot	headwaters of tributaries to Welland River	rare species; Swamp White Oak Pin Oak (Argus and White, 1977)	Brady et al., 1980 (PL 08) OMNR, 1983a (29)
PI-37E	13-8	Willoughby Marsh	water storage and recharge for numerous creeks	wildlife habitat representative remnant wetland feature rare species; Black Gum, Swamp White Oak, Pin Oak, Pignut Hickory (Argus and White, 1977) marsh is large (592 ha)	Brady et al., 1980 (NF 11) OMNR, 1983 a, d (28, 29) Regional Municipality of Niagara 1981
	19-4	Lyons Creek Floodplain Wetland		diverse wetland community	OMNR 1983 a, d (28, 29)

APPENDIX III

VEGETATION COVER TYPE MAPS -

FOR SITES EXAMINED DURING IDENTIFICATION

OF CANDIDATE SITES



OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

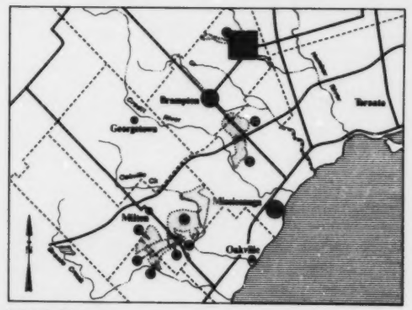
Vegetation Cover Type

- l — Lowland
- u — Upland

Cover Type Descriptor

Key Map: **PI-1A1**

Lot 10 and Part of Lot 9; Concession VII; City of Brampton, formerly the Toronto Gore



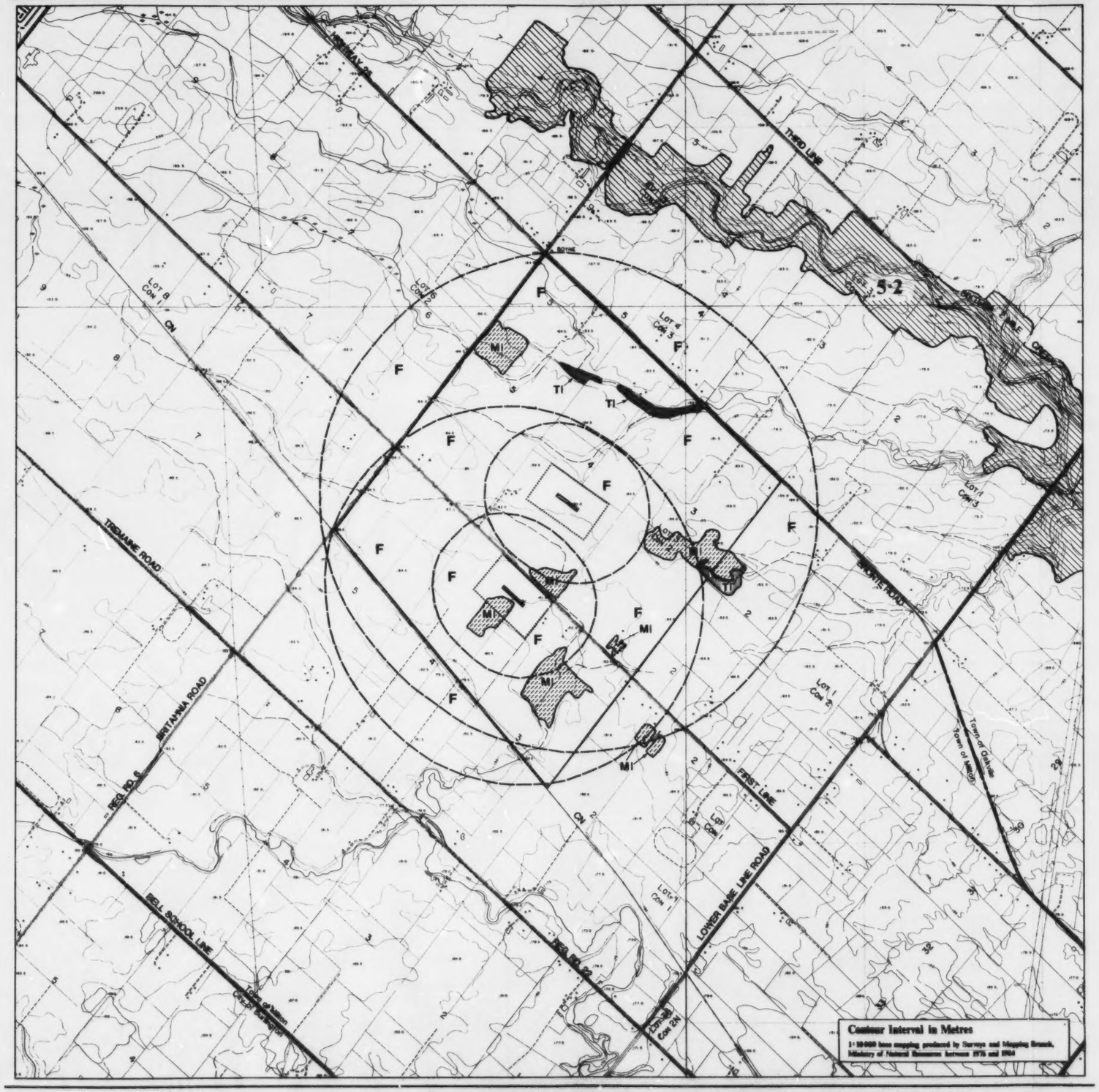
Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G·B6**



OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

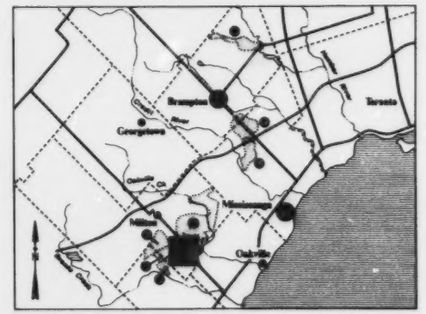
Vegetation Cover Type

- l — Lowland
- u — Upland

Cover Type Descriptor

Key Map: **PI-1 North**

Lots 3, 4 and 5; Concession II; Town of Milton; Parts of Lots 3, 4 and 5; Concession I; Town of Milton, formerly in the Township of Trafalgar



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B7**

OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

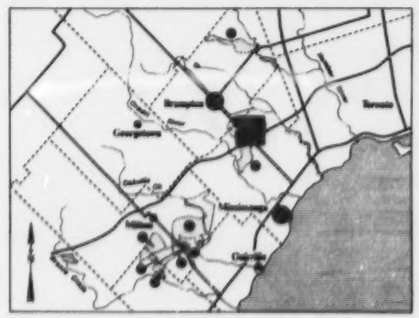
(Vegetation Cover Type)

- l — Lowland
- u — Upland

(Cover Type Descriptor)

Key Map: **LF-2 North**

Lots 9 and 10; Concession 1 EHS (East of Hurontario Street), City of Mississauga



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B8**

OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

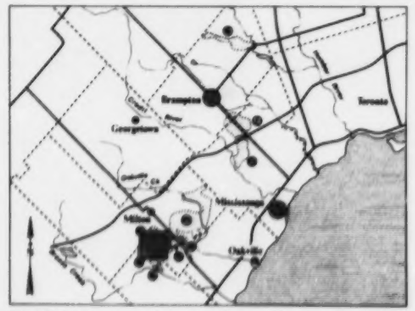
Vegetation Cover Type

- I — Lowland
- U — Upland

Cover Type Descriptor

Key Map: **LF- 4 North**

Lots 6 and 7; Concession VII; Town of Milton, formerly in the Township of Nelson



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

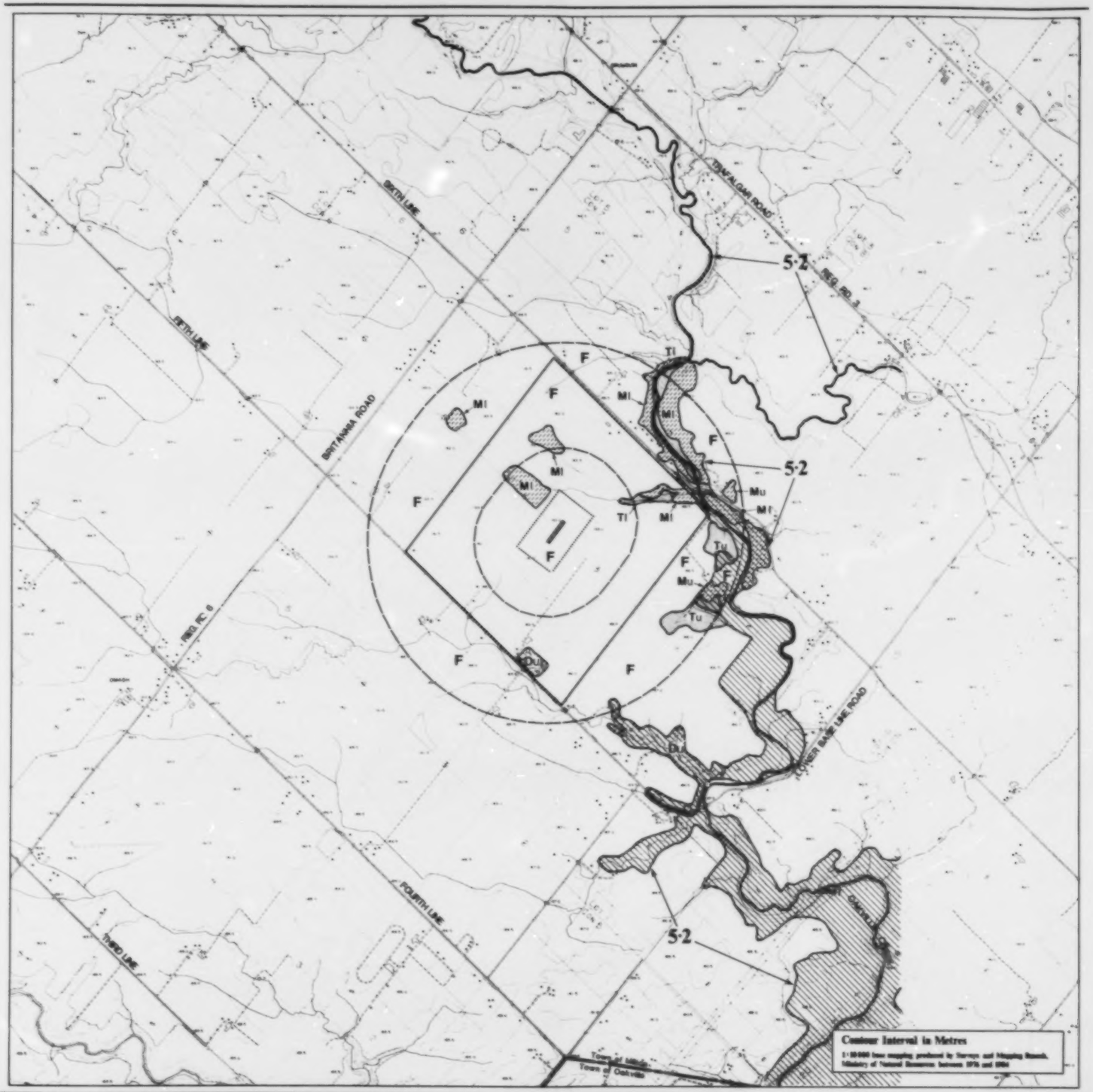
1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B 9**

Contour Interval in Metres

1:10000 base mapping produced by Surveys and Mapping Branch, Ministry of Natural Resources between 1976 and 1984



OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- HR — Hedgerow (major)
- T — Thicket
- F — Field

Vegetation Cover Type

- l — Lowland
- u — Upland

Cover Type Descriptor

Key Map: **PI-13 North**

Lots 3 and 4; Concession VI; Town of Milton, formerly the Township of Trafalgar

Field Notes:

- Vegetation communities were characterized through stephoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B10**

OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

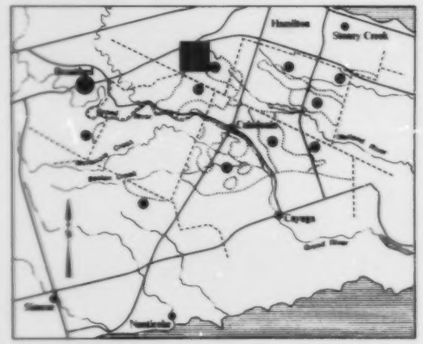
Vegetation Cover Type

- l — Lowland
- u — Upland

Cover Type Descriptor

Key Map: **PI-2 West**

Part of Lots 34, 35 and 36; Concession IV; Town of Ancaster



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B11**

OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

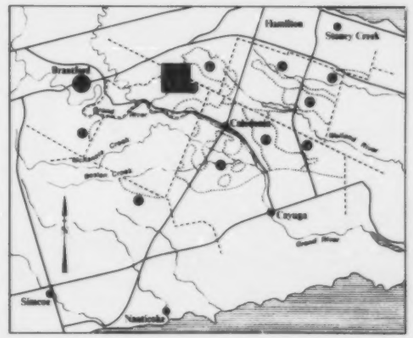
Legend:

SEUs

D	Deciduous	Vegetation Cover Type
M	Mixed	
C	Coniferous	
H	Hedgerow (major)	
T	Thicket	
F	Field	
l	Lowland	Cover Type Descriptor
u	Upland	

Key Map: **LF-10a West**

Lots 16, 17 and Part of Lots 15 and 18; Concession I; Township of Onondaga



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B12**

OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

SEUs

- D — Deciduous
- M — Mixed
- C — Coniferous
- Hedgerow (major)
- T — Thicket
- F — Field

Vegetation Cover Type

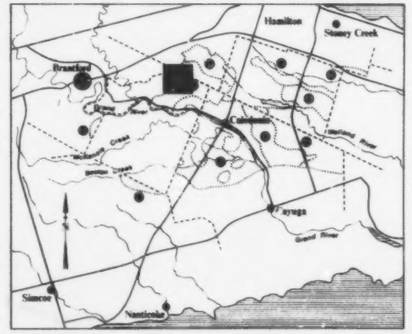
- l — Lowland
- u — Upland

Cover Type Descriptor

OPERATING AREA / ASSUMED EMISSION AREA — 100 m TECHNICAL BUFFER approx. — 500 m STUDY AREA — 1000 m STUDY AREA — LIMIT OF LANDFILL approx. — MAXIMUM POTENTIAL ACQUISITION BOUNDARY

Key Map: **LF-10b West**

Lots 16, 17 and Part of Lots 15 and 18; Concession I; Township of Onondaga



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G·B13**

OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

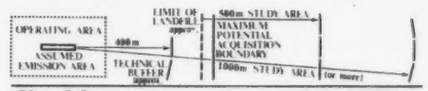
Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

Vegetation Cover Type

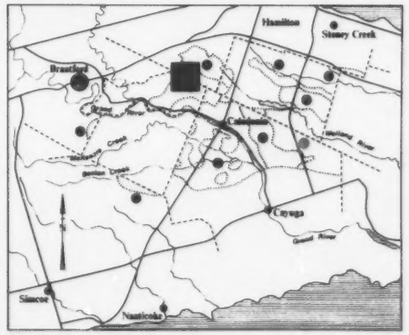
- l — Lowland
- u — Upland

Cover Type Descriptor



Key Map: **LF-11 West**

Lots 31, 32 and Part of Lot 33, Concession VI; Town of Ancaster



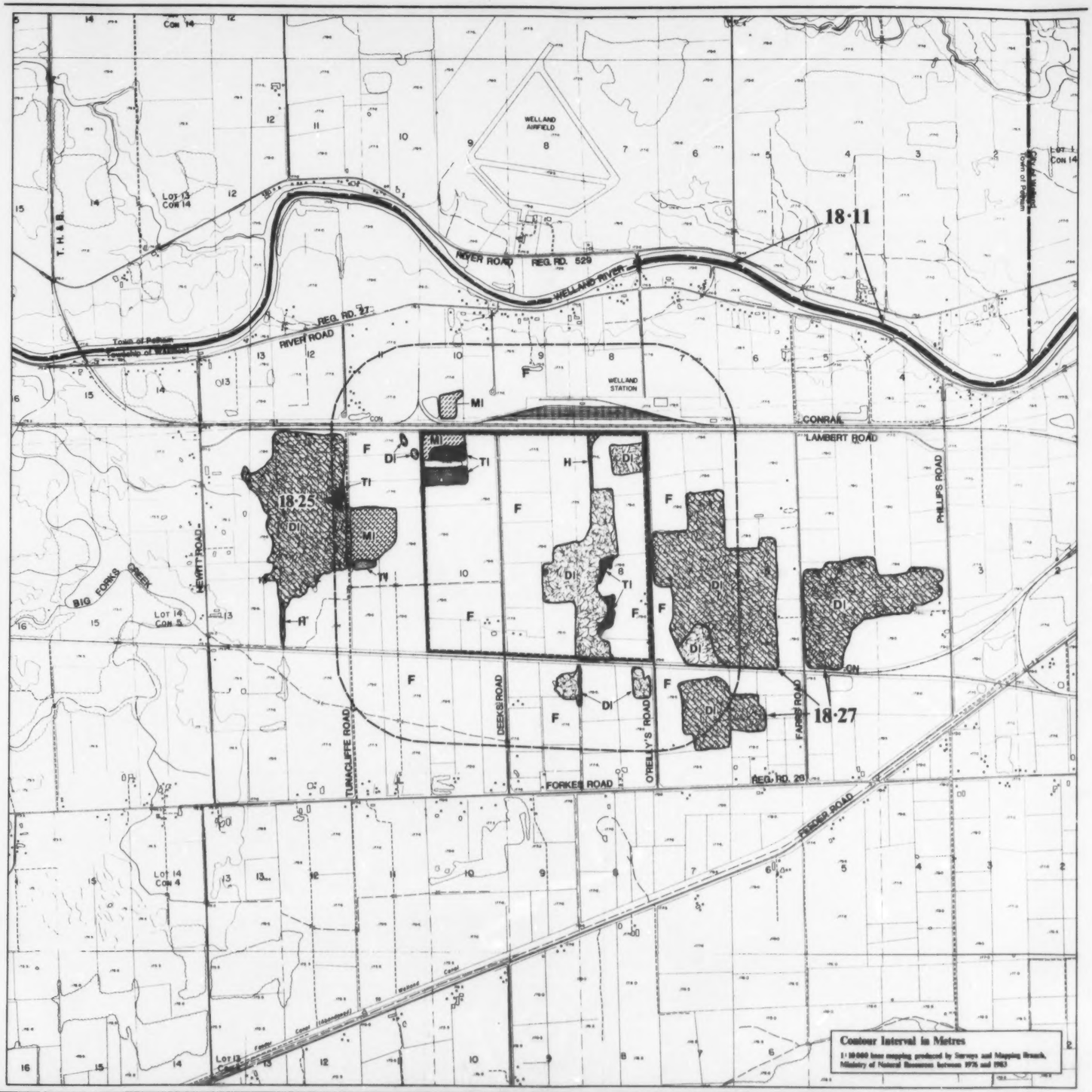
Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B14**



OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

Vegetation Cover Type

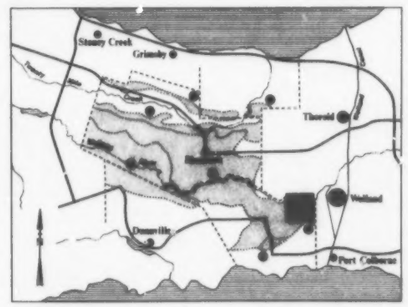
- l — Lowland
- u — Upland

Cover Type Descriptor

LIMIT OF LANDFILL EXPOSURE — not to scale — MAXIMUM POTENTIAL ACQUISITION BOUNDARY — 500 m STUDY AREA

Key Map: **LF-1 Central**

Part of Lots 8, 9, and 10; Concession V; Township of Wainfleet



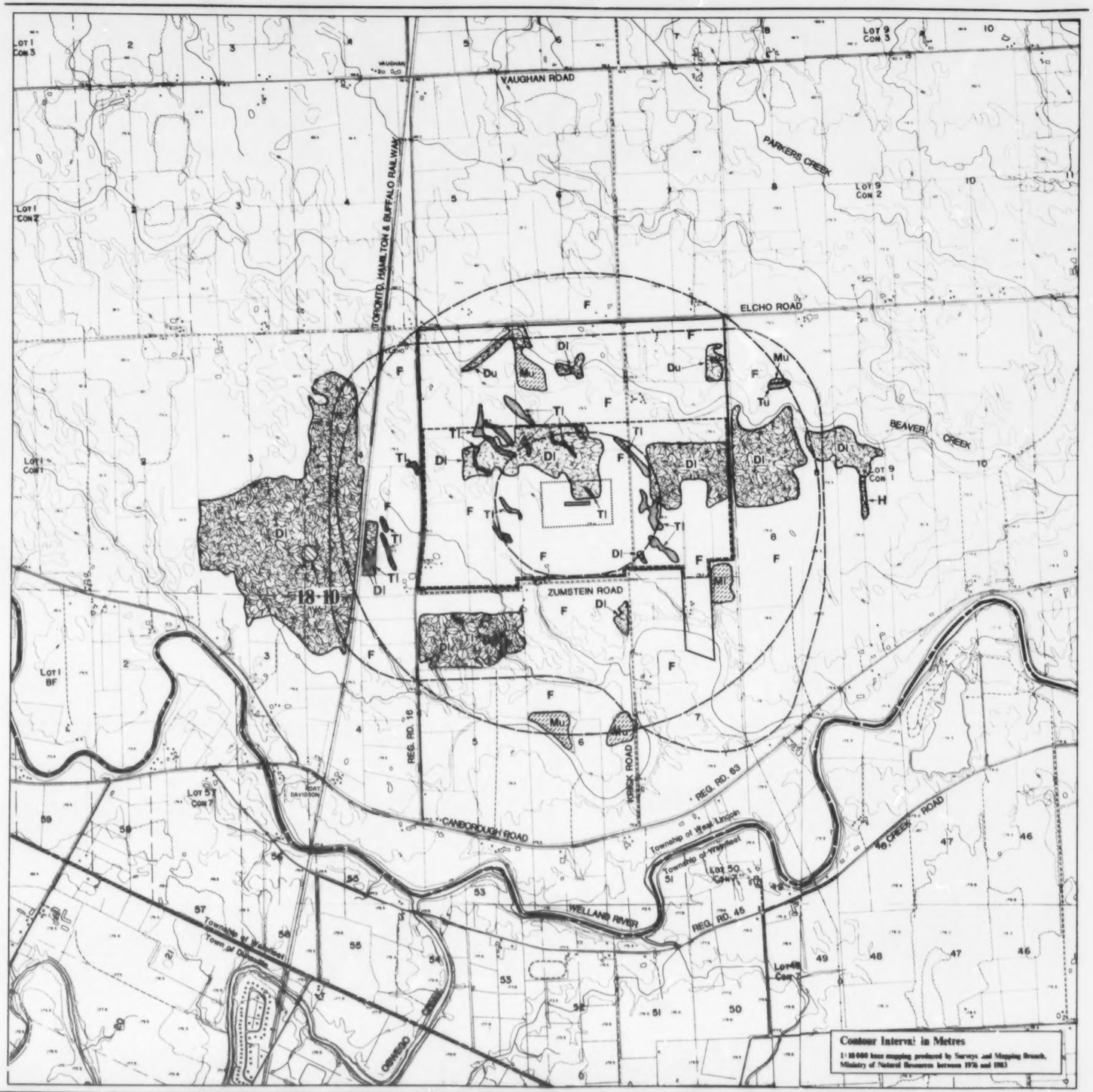
Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G·B15**



OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

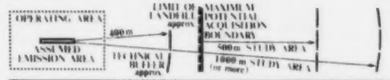
Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

Vegetation Cover Type

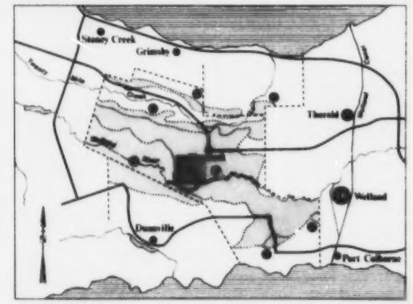
- l — Lowland
- u — Upland

Cover Type Descriptor



Key Map: **LF-3 Central**

Lots 5, 6 and 7; Concession I; Part of Lot 7; Broken Front Concession; Township of West Lincoln; formerly in the Township of Gainsborough



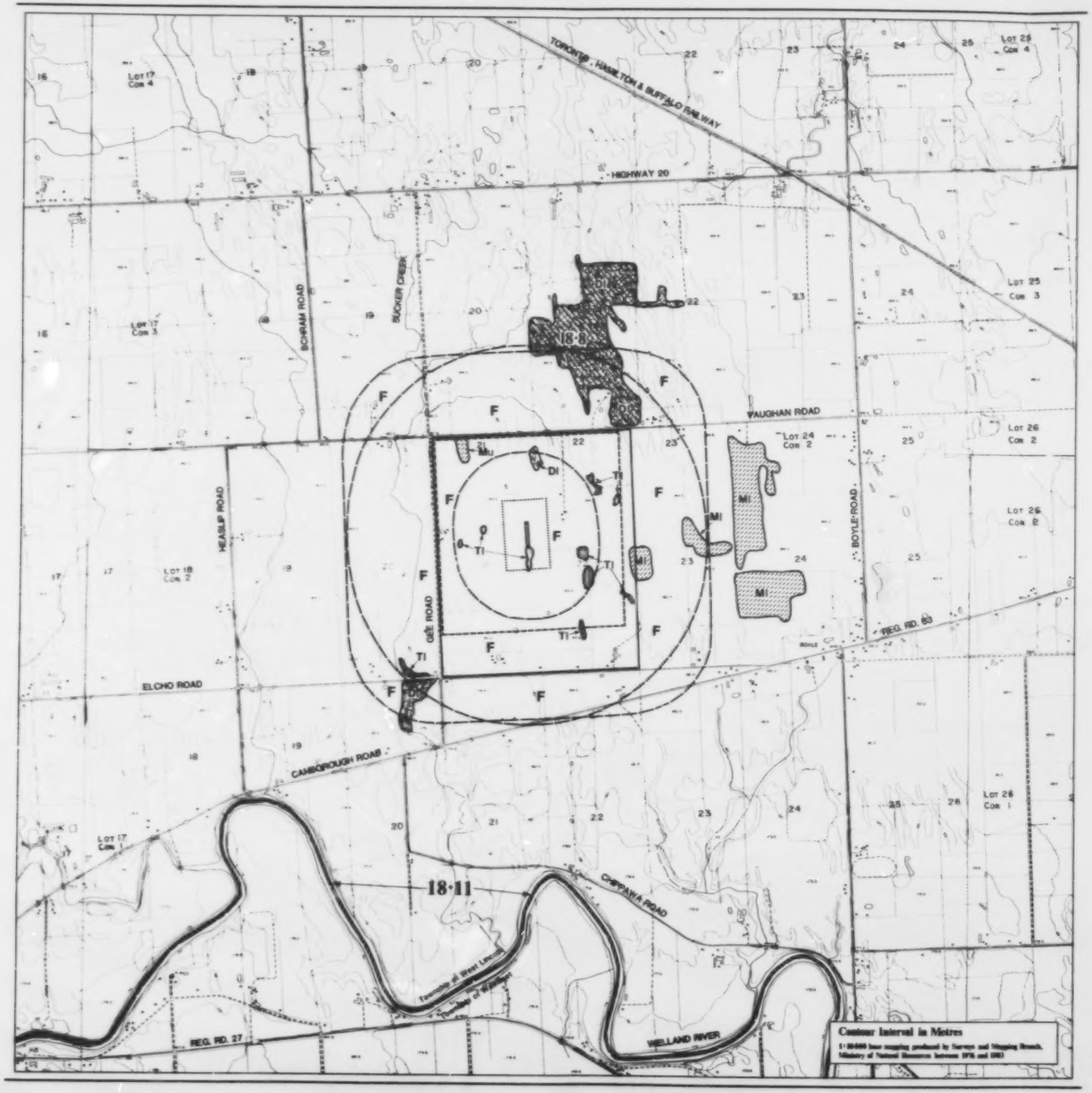
Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B16**



OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

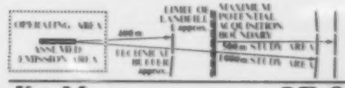
Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- Hedgerow (major)
- T — Thicket
- F — Field

(Vegetation Cover Type)

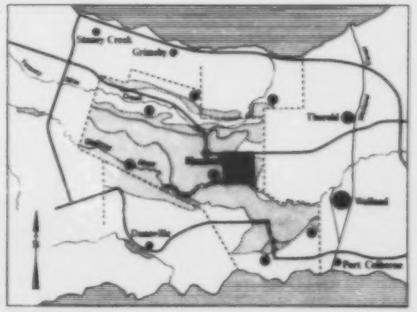
- I — Lowland
- U — Upland

(Cover Type Descriptor)



Key Map: **LF-8 Central**

Lots 21 and 22; Concession II; Township of West Lincoln; formerly in the Township of Gainsborough



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B17**

OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- Hedgerow (major)
- T — Thicket
- F — Field

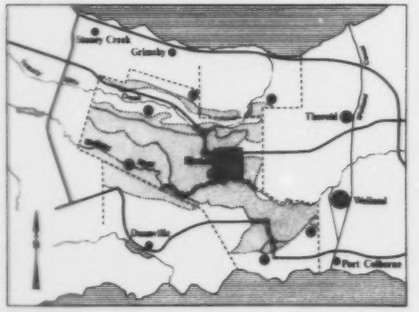
Vegetation Cover Type

- l — Lowland
- u — Upland

Cover Type Descriptor

Key Map: **LF-9 Central**

Lot 18 and Part of Lot 17; Concession III; Township of West Lincoln; formerly in the Township of Gainsborough



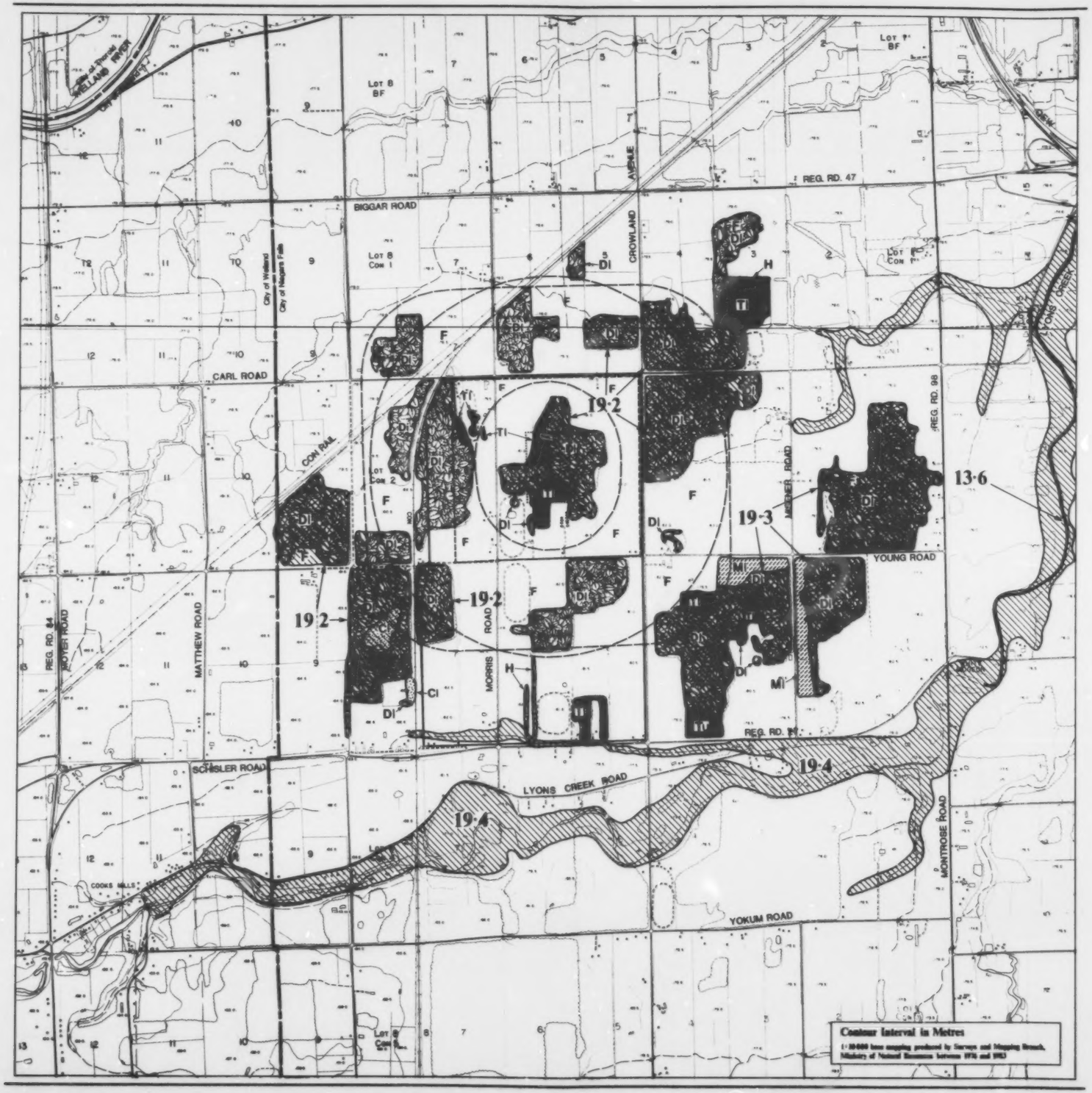
Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B18**



OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

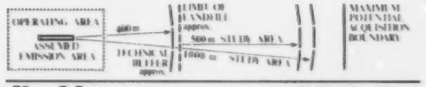
SEUs

Vegetation Cover Type:

- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

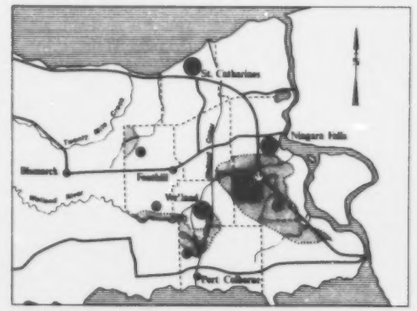
Cover Type Descriptor:

- l — Lowland
- u — Upland



Key Map: **LF-1a East**

Lots 5, 6 and 7; Concessions II and III; City of Niagara Falls; formerly in the Township of Crowland



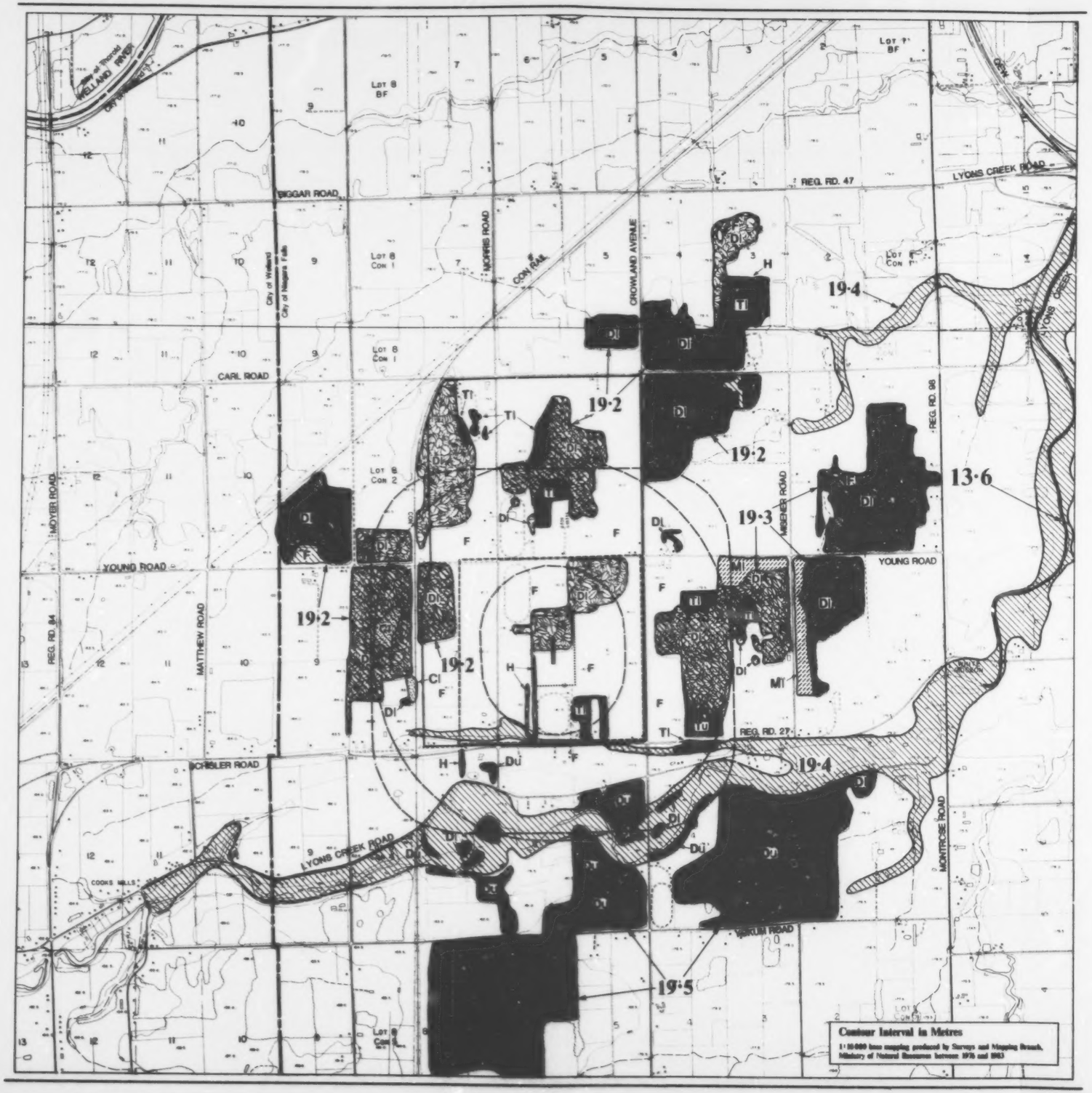
Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G·B19**



OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

SEUs

- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

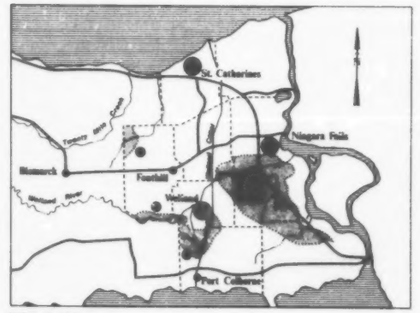
Vegetation Cover Type

- l — Lowland
- u — Upland

Cover Type Descriptor

Key Map: **LF-1b East**

Lots 5, 6 and 7; Concessions II and III; City of Niagara Falls; formerly in the Township of Crowland



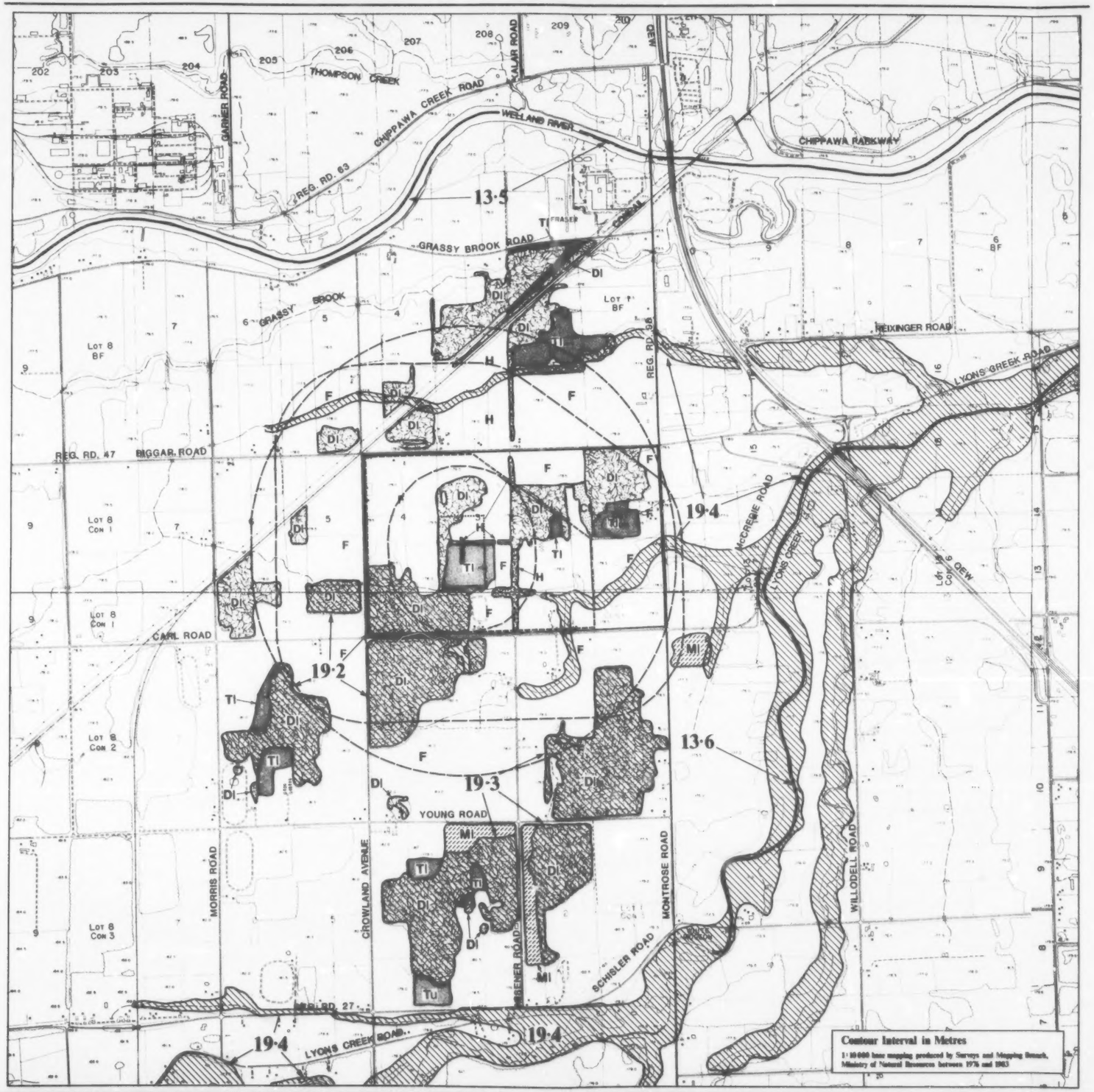
Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G·B20**



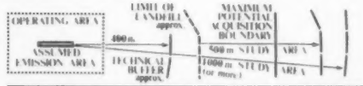
OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

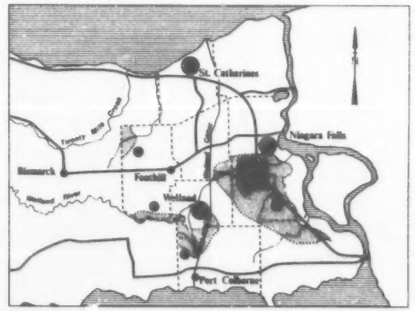
Legend:

	SEUs	
D	Deciduous	Vegetation Cover Type
M	Mixed	
C	Coniferous	
H	Hedgerow (major)	
T	Thicket	
F	Field	
l	Lowland	Cover Type Descriptor
u	Upland	



Key Map: **LF-3 East**

Lots 1, 2, 3 and 4; Concession I; City of Niagara Falls, formerly Township of Crowland



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B21**

OWMC Ontario Waste Management Corporation

Consultant:

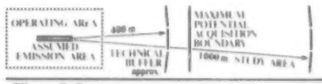
Gartner Lee Associates Limited

Legend:

SEUs

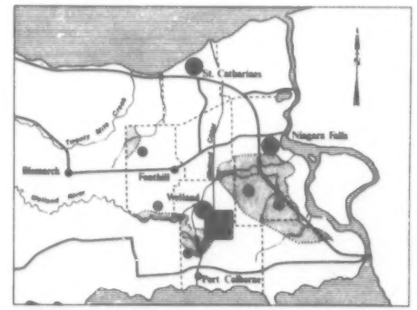
Vegetation Cover Type:
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

Cover Type Descriptor:
- I — Lowland
- U — Upland



Key Map: **PI-18 East**

Lots 15, 16 and Part of Lot 17; Concession VII; City of Welland, formerly in the Township of Crowland



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

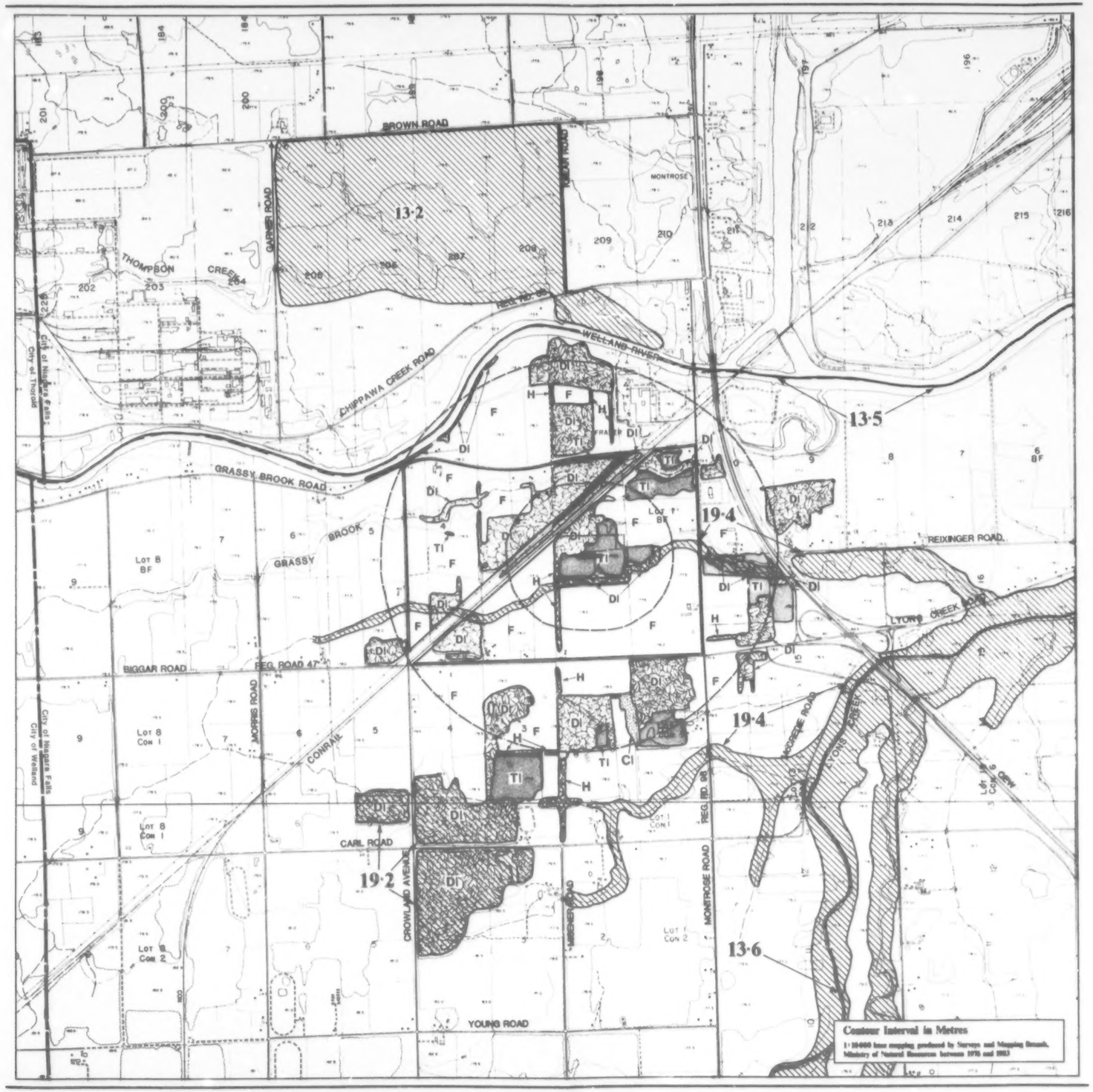
SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B22**

ANSI 48-29

Contour Interval in Metres

1:10 000 base mapping produced by Surveys and Mapping Branch, Ministry of Natural Resources between 1976 and 1983



OWMC Ontario Waste Management Corporation

Consultant:

Gartner Lee Associates Limited

Legend:

- SEUs
- D — Deciduous
- M — Mixed
- C — Coniferous
- H — Hedgerow (major)
- T — Thicket
- F — Field

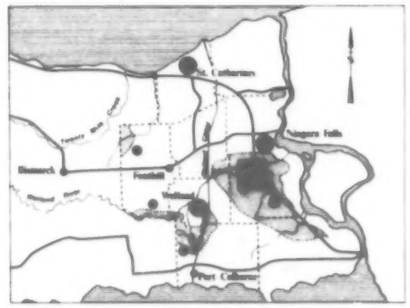
(Vegetation Cover Type)

l — Lowland
u — Upland
(Cover Type Descriptor)

OPERATING AREA — ASSUMED EMISSION AREA — TECHNICAL BUFFER APPLIED — MAXIMUM POTENTIAL ACQUISITION BOUNDARY — 1000 m = STUDY AREA

Key Map: **PI-27 East**

Part of Lots 1, 2, 3, and 4; Broken Front Concession Welland River; City of Niagara Falls; formerly in the Township of Crowland



Field Notes:

- Vegetation communities were characterized through airphoto interpretation and limited winter observations from roadsides.
- Findings are subject to confirmation following on-site study.
- Cover type evaluation was concentrated on lands within the outermost study area radius.

1000 feet 0 1000
500 metres 0 500

SEUs and Vegetation Cover Types CANDIDATE SITE IDENTIFICATION

October 1984 **FIGURE G-B23**

TABLE III.1: COMMENTS ON EACH POTENTIAL SITE

PI-1A1:

Study Unit Boundaries:

Site - Area within maximum potential acquisition boundary.

Adjacent lands - Lands other than site, within the study area radius, and lands having biological resources associated with those of the study area.

Other Comments:

- Four wooded parcels on and adjacent to the site originally designated as greater than 20 hectares each, were determined to be smaller when examined at the 1:10,000 scale. These woods are fragmented and contain tracts of thickets.

PI-1N:

Study Unit Boundaries: PI-1N (east) and PI-1N (west)

Site - Area within maximum potential acquisition boundary.

Adjacent lands - Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area

Other Comments:

- The precise location of the Oakville (Sixteen Mile) Creek SEU 5.2 boundary will be confirmed by Halton Region during Phase 4A. It was mapped because of its relative proximity to the study area boundary. Tributaries of the Sixteen Mile Creek cross the study area and enter SEU 5.2.

LF-2N:

Study Unit Boundaries:

Site - Area within maximum potential acquisition boundary.

Adjacent lands - Lands other than site, within the study area radius, and lands having biological resources associated with those of the study area.

LF-2N (cont'd)

Other Comments:

- Most of this site drains to Etobicoke Creek. The western portion drains via intermittent streams to Fletchers Creek. The study area radius does not intersect Fletchers Creek.

LF-4N:

Study Unit Boundaries:

Site	- Area within maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radius, and lands having biological resources associated with those of the study area.

Other Comments:

- Two woodlots on and adjacent to the site, originally designated as greater than 20 hectares each were determined to be smaller, after examination at 1:10,000.
- Indian Creek drains site.

PI-13N:

Study Unit Boundaries:

Site	- Area within maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radius, and lands having biological resources associated with those of the study area.

Other Comments:

- The precise location of the Oakville (Sixteen Mile) Creek SEU 5.2 boundary will be confirmed by the Halton Region during Phase 4A.
- In the OWMC Phase 3 Report Appendix (March 1984) no biological comments were noted for PI-13N.
- Although the precise location of the western boundary of SEU 5.2 is difficult to transfer from 1:50,000 to 1:10,000 scale it appears that the SEU enters or is immediately adjacent to the southeast corner of PI-13N.

PI-13N (cont'd)

- The valley which enters the southeast corner of the site probably is not SEU.
- Since SEU 5.2 influences PI-13N, during this preliminary assessment we have assigned a major biology constraint rating to this site.
- SEU 5.1 is the creek, an Area of Important Biological Resources (AIBR) of fisheries significance. An important Smallmouth Bass population inhabits the creek and this branch of Oakville (Sixteen Mile) Creek is open to lake run salmonids.

PI-2W

Study Unit Boundaries:

Site	- Area within the maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- The location of SEU 6.1 is approximate. MNR has no site boundary map for this ANSI. Two woodlots greater than 20 hectares each are on and adjacent to the southeast corner of the site. They were designated as one woodlot on the biological resources map.

LF-10W:

Study Unit Boundaries:

LF-10W(a) Site	- North half of lands within acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.
LF-10W(b) Site	- South half of lands within acquisition boundary, extends west of landfill limit to maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- SEU 16-3, Station Woods is located off-site to the southeast of LF-10W(b). It is not mapped at this scale as the precise boundaries are unknown.

LF-11W:

Study Unit Boundaries:

Site	- Area within maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- One non-SEU woodlot >20 ha exists on site. Originally designated as part of the same forest (see biological resources maps) four smaller fragmented woodlots each less than 20 hectares are located east of the site.

LF-1C:

Study Unit Boundaries:

Site	- Area within maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- One woodlot was originally determined to be greater than 20 hectares on the site. More detailed investigation has determined that there are in fact two woodlots both less than 20 hectares in size.

LF-3C:

Study Unit Boundaries:

Site	- Area within maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- The location of SEU 18-10 is approximate. MNR has no site boundary map for this ANSI. Three woodlots on and adjacent to the site were found upon examination at 1:10,000 scale, to be smaller than 20 hectares each.
- Brady et al. did not inventory this potential ESA. Thus it is not mapped as an ESA at this scale.

LF-8C:

Study Unit Boundaries:

Site	- Area within maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- Three woodlots to the east of the site, are each smaller than 20 hectares. They were designated as one feature on the biological resource maps at 1:50,000 scale.

LF-9C:

Study Unit Boundaries:

Site	- Area within maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- Sucker Creek exists to the east of the site, as does SEU 18-8.

LF-1E:

Study Unit Boundaries:

LF-1E(a) Site	- North half of lands within maximum potential acquisition boundary, extends west of landfill limit to acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.
LF-1E(b) Site	- South half of lands within maximum potential acquisition boundary, extends west of landfill limit to acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

LF-1E (cont'd)

Other Comments:

- The precise boundary of SEU 19-4 will be further defined during Phase 4. At present the SEU boundaries should be considered "soft". After examination at 1:10,000 the boundaries of a non-SEU woodlot greater than 20 ha have been altered slightly, however, the feature is still larger than 20 ha. Minor drainage swales to SEU 19-4 are shown as SEU on-site because they represent the floodplain level - a designation suggested by the MNR.

LF-3E:

Study Unit Boundaries:

Site - Area within maxiumum potential acquisition boundary

Adjacent lands - Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- The precise boundary of SEU 19-4 will be further refined during Phase 4. At present the SEU boundaries should be considered "soft". Minor drainage swales to SEU 19-4 are shown as SEU on-site because they represent the floodplain level - a designation suggested by the MNR. A woodlot originally designated as greater than 20 hectares in the north corner of the site has been determined to be smaller due to fragmentation and tree cutting.

PI-18E:

Study Unit Boundaries:

Site - Area within maximum potential acquisition boundary.

Adjacent lands - Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- A large area designated field contains primarily industrial lands. The base map does not depict these buildings.
- The location of SEU 18-10 is approximate. MNR has no site boundary map for this ANSI. This ANSI is called the Salina Formation.
- Lyons Creek is north of the site.

PI-27E:

Study Unit Boundaries:

Site	- Area within maximum potential acquisition boundary.
Adjacent lands	- Lands other than site, within the study area radii, and lands having biological resources associated with those of the study area.

Other Comments:

- The precise boundary of SEU 19-4 will be further refined during Phase 4A. At present the SEU boundaries should be considered "soft". Minor drainage swales to SEU 19-4 are shown as SEU on-site because they represent the floodplain level - a designation suggested by the MNR.

- A woodlot originally designated as greater than 20 hectares, south of the site, has been determined to be smaller due to fragmentation and tree cutting.

APPENDIX IV

STREAM CROSSINGS ALONG ALTERNATIVE ACCESS ROUTES TO POTENTIAL SITES

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
LF-4N	to LF-4N from 401	2					
	Regional: south on Hwy 25; west on Steeles Ave.; west on Britannia Rd. to LF-4N	2 crossings, tribs. to Bronte Creek. 5 km+, warm water fishery downstream	0	4	6		Major
	Local: south on First Line Rd.	-	1	2	3		Minor
	to LF-4N from 401		1				
	Regional: south on Hwy 25; west on Steeles Ave.; south on Tremaine Rd. to LF-4N		1 crossing 16 Mile Creek	12	13		Moderate
	to LF-4N from 401						
	Regional: south on Fourth Line Rd.; west on Britannia Rd.	2 2 crossings, trib. to Bronte Creek. 5 km+, warm water fishery	1 1 crossing 16 Mile Creek	6	9		Major
	Local: south on Fourth Line Rd.	1 1 crossing, 16 Mile Creek, Salmonid fish migration	-	3	4		Major
	to LF-4N from 401	3	1				
	Regional: south on Fourth Line, east on Derry Rd., west on Britannia Rd. to LF-4N	1 crossing 16 Mile Creek, Salmonid fish migration 2 crossings, tribs. to Bronte Creek, 5 km+ warm water fishery	1 crossing 16 Mile Creek	9	13		Major
	Local: south on Fifth Line Rd.	-	0	4	4		Minor

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
LF-4N (cont'd)	to LF-4N from 401 Regional: south of Trafalgar Rd.; west on Britannia Rd. to LF-4N	3 1 crossing of 16 Mile Creek, salmonid fish migration 2 crossings trib. to Bronte Creek 5 km+, warm water fishery downstream	1 1 crossing of 16 Mile Creek	14	18		Major
	to LF-4N from 403 Regional: north on Winston Churchill Blvd.; west on Britannia Rd. to LF-4N	4 2 crossings trib. to Bronte Creek, 5 km+ warm water fishery downstream 2 crossings 16 Mile Creek, salmonid fish migration	1 1 crossing of 16 Mile Creek	25	30		Major
	to LF-4N from QEW Regional: north on Trafalgar Rd. west on Britannia Rd. to LF-4N	2 2 crossings 16 Mile Creek, salmonid fish migration	1 1 crossing of Mile Creek	26	29		Major
	to LF-4N from QEW Regional: north on Hwy.25 (Bronte Rd.); west on Britannia Rd. to LF-4N.	3 1 adjacent to Bronte Crk. salmonid fish migration, 2 crossings trib. to Bronte Crk. 5 km+ warm water fishery downstream	-	13	16	Hwy. 25 along top of Bronte Creek bank	Major
	PI-1N to LF-4N Regional: west on Britannia Rd. to LF-4N	2 2 tribs. to Bronte Creek, 5 km+, warm water fishery downstream	-	-	2		Major

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE				
			PERMANENT	INTERMITTENT	TOTAL NUMBER		
LF-4N (cont'd)	PI-13N to LF-4N Regional: west on Britannia Rd.	2 2 tribs. to Bronte Creek 5 km downstream warm water fishery	1 1 crossing of main branch of 16 Mile Creek	7	10		Major
	Local: north on Fifth Line Rd. to LF-4N	-	-	2	2		No
LF-2N	to LF-2N from 401 Regional: north on Hwy 10 to LF-2N	-	-	2	2		No
	to LF-2N from 410 Regional: west on Derry Rd. E. to LF-2N	-	-	2	2		No
	PI-1A1 to LF-2N Regional: south on Airport Rd.; west on Derry Rd. E. to LF-2N	-	3 1 crossing main branch of each Etobicoke, Mimico, Spring Creeks	23	26		Moderate
	PI-1A1 to LF-2N Regional: south on Airport Rd.; west on Steeles Ave.; south on Dixie Rd.; west on Derry Rd. E. to LF-2N	-	3 1 crossing main branch of Etobicoke Creek	30	33		Moderate

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
LF-2N (cont'd)	PI-13N to LF-2N	1 1 crossing 16 Mile Creek, salmonid fish migration	-			Cross Credit River on 401, an important salmonid river	Major
	Regional: east on Britannia Rd.; north on Trafalgar Rd.; east on 401; north on Hwy 10 to LF-2N	-	-	12	13		
	Local: north on Fifth Line Rd.	-	-	-	-		No
	PI-13N to LF-2N					Cross Credit River on 401, an important salmonid river	No
	Regional: west on Britannia Rd.; north on Fourth Line Rd.; east on 401; north on Hwy 10 to LF-2N	-	-	3	3		
	Local: north on Fifth Line Rd.; north on Fourth Line Rd.	1 1 crossing of 16 Mile Creek, salmonid fish migration	-	5	6		Major
	PI-13N to LF-2N					Cross Credit River on 401, an important salmonid river	No
	Regional: west on Derry Rd.; north on Fourth Line Rd.; east on 401; north on Hwy.10 to LF-2N	-	-	4	4		
	Local: north on Fifth Line Rd.; north on Fourth Line Rd.	1 crossing of 16 Mile Creek, salmonid fish migration	-	4	5		Major

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE		TOTAL NUMBER		
			PERMANENT	INTERMITTENT			
LF-2N (cont'd)	PI-1N to LF-2N Regional: east on Britannia Rd.; north on Trafalgar Rd.; east on 401; north on Hwy 10 to LF-2N	1 1 crossing of 16 Mile Creek, salmonid fish migration	1 1 crossing of 16 Mile Creek	11	13	Cross Credit River on 401, an important salmonid river	Major
	PI-1N to LF-2N Regional: east on Britannia Rd.; north on Fourth Line Rd.; east on 401; north on Hwy 10 to LF-2N	-	1 1 crossing of 16 Mile Creek	8	9	Cross Credit River on 401, an important salmonid river	Major
	Local: north on Fourth Line Rd.	1 1 crossing of 16 Mile Creek, salmonid fish migration	-	3	4		Major
	PI-1N to LF-2N Regional: east on Steeles Ave.; north on Hwy 25; east on 401; north on Hwy 10 to LF-2N	2 2 trib. to Bronte Creek S km+ warm water fishery downstream	-	4	6	Cross Credit River on 401; an important salmonid river	Major
	Local: north on First Line Rd.	-	-	4	4		Minor
	PI-1N to LF-2N Regional: west on Britannia Rd.; north on Tremaine Rd.; east on Steeles Ave.; north on Hwy 25; east on 401; north on Hwy 10 to LF-2N	-	1	16	17	Cross Credit River on 401; an important salmonid river	Moderate

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
PI-IN	to PI-IN from 401						Major
	Regional: south on Hwy 25, west on Steeles Ave.	2 2 tribs. to Bronte Creek, 5 km+ warm water fishery downstream	-	2	4		
	Local: south on First Line Rd. to PI-IN	-	-	4	4		Minor
	to PI-IN from 401						Moderate
	Regional: south on Hwy 25; west on Steeles Ave.; south on Tremaine Rd.; east on Britannia Rd. to PI-IN	-	1	14	15		
	to PI-IN from 401						Moderate
	Regional: south on Fourth Line Rd.; west on Britannia Rd. to PI-IN	-	1 1 crossing of 16 Mile Creek	3	4		
	Local: south on Fourth Line Rd.	1 1 crossing 16 Mile Creek, salmonid fish migration	-	3	4		Major
	To PI-IN from 401						Major
	Regional: south on Trafalgar Rd.; west on Britannia Rd. to PI-IN	1 1 crossing of 16 Mile Creek, salmonid fish migration	1 1 crossing of 16 Mile Creek	14	16		
	To PI-IN from 403						Major
	Regional: north on Winston Churchill Blvd.; west on Britannia Rd. to PI-IN	2 2 crossings of 16 Mile Creek, salmonid fish migration	1 crossing of 16 Mile Creek	16	19		

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE				
			PERMANENT	INTERMITTENT	TOTAL NUMBER		
PI-1N (cont'd)	to PI-1N from QEW Regional: north on Trafalgar Rd.; west on Britannia Rd. to PI-1N	2 2 crossings of 16 Mile Creek, salmonid fish migration	1 1 crossing of 16 Mile Creek	19	22		Major
	to PI-1N from QEW Regional: north on Hwy 25 (Bronte Rd.) to PI-1N	1 Bronte Creek salmonid fish migration	-	11	12	Hwy 25 along top of Bronte Creek bank	Major
PI-13N	to PI-13N from 401 Regional: south on Fourth Line Rd.; east on Britannia Rd.	-	-	1	1		No
	Local: south on Fourth Line Rd.; south on Fifth Line Rd. to PI-13N	1 1 crossing 16 Mile Creek, salmonid fish migration	-	5	6		Major
	to PI-13N from 401 Regional: south on Fourth Line Rd.; east on Derry Rd.	-	-	2	2		Minor
	Local: south on Fourth Line Rd.; south on Fifth Line Rd. to PI-13N	-	-	5	5		Minor
	to PI-13N from 401 Regional: south on Trafalgar Rd.; west on Britannia Rd.	1 1 crossing 16 Mile Creek, salmonid fish migration	-	7	8		Major
	Local: south on Fifth Line Rd. to PI-13N	-	-	2	2		No

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
PI-13N (cont'd)	to PI-13N from 403	2					
	Regional: north on Winston-Churchill Blvd.; west on Britannia Rd.	2 crossings of 16 Mile Creek salmonid fish migration	-	19	21		Major
	Local: south on Fifth Line Rd. to PI-13N	-	-	2	2		No
	to PI-13N from QEW	2					
	Regional: north on Trafalgar Rd. west on Britannia Rd.	2 crossings of 16 Mile Creek, salmonid fish migration	-	12	14		Major
	Local: south of Fifth Line Rd. to PI-13N	-	-	2	2		No
	to PI-13N from QEW	1	1				
	Regional: north on Hwy 25 (Bronte Rd.); east on Britannia Rd.	Bronte Creek salmonid fish migration	1 crossing of 16 Mile Creek	16	18	Hwy 25 along top of Bronte Creek bank	Major
	Local: south on Fifth Line Rd. to PI-13N	-	-	2	2		No
PI-IA1	to PI-IA1 from 401		3				
	Regional: north on Hurontario St.; east on Derry Rd. E.; north on Airport Rd. to PI-IA1	-	1 crossing, main branch of each, Etobicoke, Mimico, Spring Creeks	25	28		Moderate

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE				
			PERMANENT	INTERMITTENT	TOTAL NUMBER		
PI-1A1 (cont'd)	to PI-1A1 from 401		3				Moderate
	Regional: north on Hurontario St. east on Derry Rd. E.; north on Dixie Rd.; east on Steeles Ave.; north on Airport Rd. to PI-1A1	-	1 crossing each, main branch of each, Etobicoke, Mimico, Spring Creeks	31	34		
	to PI-1A1 from 410		3				Moderate
	Regional: east on Derry Rd. E.; north on Airport Rd. to PI-1A1	-	1 crossing each, main branch of each, Etobicoke, Mimico, Spring Creeks	21	24		
	to PI-1A1 from 410		3				Moderate
	Regional: east on Derry Rd. E.; north on Dixie Rd.; east on Steeles Ave.; north on Airport Rd. to PI-1A1	-	1 crossing each, main branch of each, Etobicoke, Mimico, Spring Creeks	27	30		
LF-10W	to LF-10W from 403						Minor
	Regional: west on Hwy 2; south on Regional Road 22	-	-	6	6	Headwater of Big Creek	
	Local: west on Sawmill Rd. to LF-10W	-	-	1	1	Headwater of Big Creek	No
	PI-2W to LF-10W						Minor
	Regional: west on Hwy 2/53; south on Regional Rd. 22	-	-	6	6	Headwater of Big Creek	
	Local: west on Sawmill Rd.	-	-	1	1	Headwater of Big Creek	No

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE				
			PERMANENT	INTERMITTENT	TOTAL NUMBER		
LF-11W	to LF-11W from 403						
	Regional: west on Hwy 2; south on Regional Rd. 22 to LF-11W	-	-	5	5	Headwater of Big Creek	No
	PI-2W to LF-11W						
	Regional: west on Hwy 2/53; south on Regional Rd. 22	-	-	5	5	Headwater of Big Creek	No
PI-2W	to PI-2W from 403						
	Regional: west on Hwy 2	-	-	-	-		No
	Local: south on Shaver Rd. to PI-2W	-	-	-	-		No
LF-1C	to LF-1C from QEW	1	5				Major
	Regional: south on Regional Rd. 24 (Victoria Ave./ Vineland Townline Rd.); east on Regional Rd. 23 (Forkes Rd.)	1 crossing 20 Mile Creek, salmonids below escarpment	5 crossings including Little Forks Creek 15 Mile, 16 Mile Creeks and the Welland River	12	18		
	Local: north on O'Reilly's Rd. to LF-1C	-	-	-	-		No
	to LF-1C from 406 (proposed)		3			Also passes under active Welland Canal twice	Moderate
	Regional: east on Regional Rd. 27 (East Main St.); south on Hwy 140; west on Townline Rd.; south on Hwy 58; west on Regional Rd. 23 (Forkes Rd.)	-	3 crossings including Lyons Creek and Welland Canal (abandoned)	-	3		
	Local: west on Netherby Rd.; south on Rusholme Rd.; north on O'Reilly's Rd. to LF-1C	-	-	-	-		No

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
LF-1C (cont'd.)	to LF-1C from 406 (existing)		6				Major
	Regional: south on Regional Rd. 50 (Hwy 5E); east on Division St. (Reg.Rd.527) north on Burgar St.(Reg. Rd.527); east on Reg.Rd. 27 (East Main St.);south on Hwy 140; west on Townline Rd.; south on Hwy. 58; west on Regional Rd. 23 (Fortes Rd.)	-	6 crossings including Lyons Creek and Welland Canal (abandoned)	-	6	Also passes under active Welland Canal twice Municipal water intake 300 m from junction of Hwy 58 and Old Welland Canal	
	Local: west on Netherby Rd.; south on Rusholme Rd.; north on O'Reilly's Rd. to LF-1C	-	-	-	-		No
	PI-18E to LF-1C		2				Minor
	Regional: south on Hwy 140; west on Townline Rd.; south on Hwy 58; west on Regional Rd. 23	-	2 crossings of Welland Canal (abandoned)	-	2	Also passes under active Welland Canal	
	Local: west on Netherby Rd.; south on Rusholme Rd.; north on O'Reilly's Rd. to LF-1C	-	-	-	-		No
LF-3C	to LF-3C from QEW	1	3	19	23		Major
	Regional: south on Vineland Townline Rd. (Regional Rd.24); west on Hwy 20; south on Regional Rd. 27	1 crossing 20 Mile Creek, salmonids below escarpment	3 crossings including Parkers, 15 Mile and 16 Mile Creeks				
	Local: west on Elcho Rd. to LF-3C	-	3 3 crossings including Beaver and Parkers Creeks	1	4		Minor

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE				
			PERMANENT	INTERMITTENT	TOTAL NUMBER		
LF-3C (cont'd)	to LF-3C from QEW	1	5				Major
	Regional: south on Vineland Townline Rd. (Regional Rd. 24); west on Canborough Rd.; north on Regional Rd. 27	1 crossing of 20 Mile Creek, salmonids below escarpment	5 crossings including Welland River and Parkers, 15 Mile and 16 Mile Creeks	16	22		
	Local: west on Elcho Rd. to LF-3C	-	3 crossings including Beaver and Parkers Creeks	1	4		Minor
	to LF-3C from QEW		5				Moderate
	Regional: south on Regional Rd. 18 (Beamsville Rd.); west on Regional Rd. 69 (Twenty Mile Rd.); south on Regional Rd. 569; south on Hwy 20; south on Regional Rd. 27	-	5 crossings including Spring, Parkers, 16 Mile and 20 Mile Creeks	6	11		
	Local: west on Elcho Rd. to LF-3C	-	3 crossings including Beaver and Parkers Creeks	1	4		Minor
	to LF-3C from QEW		5				Moderate
	Regional: south on Regional Rd. 14; south on Regional Rd. 714; east on Regional Rd. 73; south on Regional Rd. 14; east on Hwy 20; south on Regional Rd. 27	-	5 crossings including Parkers, 16, 20 and 30 Mile Creeks	11	16	Lake Ontario downstream near access from QEW	
	Local: west on Elcho Rd. to LF-3C	-	3 crossings including Beaver and Parkers Creeks	1	4		Minor

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
LF-3C (cont'd)	to LF-3C from QEW		3				Moderate
	Regional: south on Regional Rd. 14; south on Regional Rd. 714; east on Regional Rd. 73; south on Regional Rd. 14; south on Regional Rd. 16 to LF-3C	-	3 crossings of Beaver, 30 Mile, 20 Mile and North Creeks	12	15	Lake Ontario downstream near access from QEW	
	to LF-3C from QEW		6				Moderate
	Regional: south on Regional Rd. 12; east on Hwy 20; south on Regional Rd. 27	-	6 crossings including 40, 16 and 20 Mile and Parkers Creeks	15	21	Lake Ontario downstream near access from QEW	
	Local: west on Elcho Rd. to LF-3C	-	3 crossings including Beaver and Parkers Creeks	1	4		Minor
	to LF-3C from QEW		5				Moderate
	Regional: south on Regional Rd. 12; east on Hwy 20; south on Regional Rd. 14, south on Regional Rd. 16 to LF-3C	-	5 crossings including Beaver, North, 40 Mile and 20 Mile Creeks	16	21	Lake Ontario downstream near access from QEW	
	to LF-3C from QEW		5				Moderate
	Regional: south on Regional Rd. 14; east on Regional Rd. 81; south on Regional Rd. 514; south on Regional Rd. 14; south on Regional Rd. 16 to LF-3C	-	5 crossings including Beaver, North, 20 Mile and 30 Mile Creeks	17	22	Lake Ontario downstream near access from QEW	

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERENNIAL	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
LF-3C (cont'd)	to LF-3C from QEW						
	Regional: south on Regional Rd. 14; east on Regional Rd. 81; south on Regional Rd. 514; south on Regional Rd. 14; east on Hwy 20; south on Regional Rd. 27	-	6 6 crossings including Parkers, 16 Mile, 20 Mile and 30 Mile Creeks	16	22	Lake Ontario downstream near access from QEW	Moderate
	Local: west on Elcho Rd. to LF-3C	-	3 3 crossings including Beaver and Parkers Creeks	1	4		Minor
LF-8C	to LF-8C from QEW						
	Regional: south on Vineland Townline Rd. (Regional Rd. 24); west on Hwy 20	1 1 crossing of 20 Mile Creek, salmonids below escarpment	2 2 crossings including 15 Mile and 16 Mile Creeks	13	16		Major
	Local: south on Gee Rd. to LF-8C	-	-	1	1		No
	to LF-8C from QEW						
	Regional: south on Vineland Twp. Rd. (Regional Rd. 24); west on Canborough Rd. to LF-8C	1 1 crossing of 20 Mile Creek, salmonids below escarpment	2 2 crossings including 15 Mile and 16 Mile Creeks	12	15		Major
	to LF-8C from QEW						
	Regional: south on Regional Rd. 18; west on Regional Rd. 69; south on Regional Rd. 569; south on Hwy 20	-	4 4 crossings including 16 Mile, 20 Mile and Spring Creeks	8	12		Moderate
	Local: south on Gee Rd. to LF-8C	-	-	1	1		No

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
LF-8C (cont'd)	to LF-8C from QEW Regional: south on Regional Rd. 14; south on Regional Rd. 714; east on Regional Rd. 73; south on Regional Rd. 14; east on Hwy 20	-	4 4 crossings including 16 Mile, 20 Mile and 30 Mile Creeks	13	17	Lake Ontario downstream near access from QEW	Moderate
	Local: south on Gee Rd. to LF-8C	-	-	1	1		No
	to LF-8C from QEW Regional: south on Regional Rd. 12; east on Hwy 20	-	5 5 crossings including 16 Mile, 20 Mile and 40 Mile Creeks	17	22	Lake Ontario downstream near access from QEW	Moderate
	Local: south on Gee Rd. to LF-8C	-	-	1	1		No
	to LF-8C from QEW Regional: south on Regional Rd. 14; east on Regional Rd. 81; south on Regional Rd. 514; south on Regional Rd. 14; east on Hwy 20.	-	5 5 crossings including 16 Mile, 20 Mile and 30 Mile Creeks	18	23	Lake Ontario downstream near access from QEW	Moderate
	Local: south on Gee Rd. to LF-8C	-	-	1	1		No
LF-9C	to LF-9C from QEW Regional: south on Vineland Twp. Rd. (Regional Rd. 24); west on Hwy 20 to LF-9C	1 1 crossing of 20 Mile Creek, salmonids below escarpment	2 2 crossings including 15 Mile and 16 Mile Creeks	15	18		Major

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
LF-9C (cont'd)	to LF-9C from QEW Regional: south on Regional Rd. 18; west on Regional Rd. 66; south on Regional Rd. 589; south on Hwy 20 to LF-9C	-	4 4 crossings including 16 Mile, 20 Mile and Spring Creeks	7	11		Moderate
	To LF-9C from QEW Regional: south on Regional Rd. 14; south on Regional Rd. 714; east on Regional Rd. 73, south on Regional Rd. 14; east on Hwy 20 to LF-9C	-	4 4 crossings including 16 Mile, 20 Mile and 30 Mile Creeks	12	16	Lake Ontario downstream near access from QEW	Moderate
	To LF-9C from QEW Regional: south on Regional Rd. 12; east on Hwy 20 to LF-9C	-	5 5 crossings including 16 Mile and 20 Mile Creeks	16	21	Lake Ontario downstream near access from QEW	Moderate
	to LF-9C from QEW Regional: south on Regional Rd. 14; east on Regional Rd. 81; south on Regional Rd. 514; south on Regional Rd. 14; east on Hwy 20 to LF-9C	-	5 5 crossings including 16 Mile, 20 Mile and 30 Mile Creeks	17	22	Lake Ontario downstream near access from QEW	Moderate
LF-1E	to LF-1E from 406 (existing) Regional: south on Hwy 58 (Regional Rd. 50); east on Division St.(Reg. Rd. 527); north on Burgar St. (Reg.Rd.527); east on Regional Rd.27 to LF-1E	-	4 4 crossings of Welland Canal (abandoned), Welland River	1	5	Municipal Water intake 300 m from junction of Hwy 58 and Old Welland Canal	Major

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
LF-1E (cont'd)	to LF-1E from QEW						
	Regional: west on Regional Rd. 47 (Lyon Creek Rd); south on Regional Rd. 98 (Montrose Rd.)	-	-	1	1	Tributary to Lyons Creek	No
	Local: from Regional Rd. 98 - west on Carl Rd. to LF-1E	-	-	1	1	Tributary to Lyons Creek	No
	to LF-1E from 406 (proposed)						
	Regional: east on Regional Road 27 to LF-1E	-	-	2	2	Route pases beneath the Welland Canal	No
	PI-27E to LF-1E						
	Regional: east on Biggar Rd. (Regional Rd 47); south on Regional Rd 98 (Montrose Rd.)	-	-	2 crossings of tributary to Lyons Creek	2		No
	Local: West on Carl Rd.	-	-	-	-		No
LF-3E	to LF-3E		5				
	Regional: from 406 (existing) - south on Hwy 58 (Regional Rd. 50); east on Division St. (Reg.Rd.527); north on Burgar St.(Reg. Rd.527); east on Regional Rd.27; north on Reg.Rd. 84 (Moyer Rd.); east on Biggar Rd. (Regional Rd. 47) to LF-3E	-	5 crossings including Welland Canal (abandoned) and Grassy Brook	4	9	Municipal water intake 300m from Junction of Hwy 58 and Old Welland Canal	Major

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE				
			PERMANENT	INTERMITTENT	TOTAL NUMBER		
LF-3E (cont'd)	to LF-3E Regional: from QEW - west on Regional Rd. 47 (Lyons Creek Rd./Biggar Rd.) to LF-3E	-	-	-	-		No
	to LF-3E Regional: from 406 (proposed) - east on Regional Rd. 27; north on Regional Rd. 84 (Moyer Rd.); east on Biggar Rd. (Regional Rd. 47) to LF-3E	-	2 2 crossings of Grassy Brook	4	6		Moderate
	PI-27E to LF-3E Direct access between sites	-	-	-	-		No
PI-18E	to PI-18E from 406 (proposed) Regional: east on Regional Rd. 27; south on Hwy. 140 to PI-18E	-	1 crossing of Lyons Creek	-	1	Industrial water intake aproximately 760 m upstream	Minor
	to PI-18E from 406 (existing) Regional: south on Reg.Rd.50 (Hwy.58); east on Division St.(Reg.Rd.527); north on Burgar St.(Reg. Rd.527); east on Reg.Rd. 27; south on Hwy.140 to PI-18E		4 4 crossings including Welland Canal (abandoned) and Lyons Creek	-	4	Municipal water intake 300 m from junction of Hwy.58 and Old Welland Canal	Major
PI-27E	to PI-27E from 406 (existing) Regional: South on Hwy. 58 (Regional Rd. 50); east on Division St. (Reg.Rd. 527); north on Burgar St. (Reg.Rd.527); east on Reg. Rd. 27; north on Reg. Rd. 84 (Moyer Rd.); east on Biggar Rd. to PI-27E	-	5 5 crossings including Welland Canal (abandoned) and Grassy Brook	4	9	Municipal water intake 300 m from junction of Hwy. 58 and the Old Welland Canal	Major

STREAM CROSSINGS ALONG ACCESS ROUTES TO POTENTIAL SITES

Table IV

SITE (COMBINATION)	ACCESS OPTION	NO. OF STREAM CROSSINGS				REMARKS	CONSTRAINT
		SENSITIVE USE KNOWN	NO SENSITIVE USE PERMANENT	NO SENSITIVE USE INTERMITTENT	TOTAL NUMBER		
P1-27E (cont'd)	to P1-27E from QEW Regional: west on Regional Rd. 47 (Lyons Creek Rd./ Biggar Rd.) to P1-27E	-	-	-	-	-	No
	to P1-27E from 406 (proposed) Regional: east on Regional Rd. 27; north on Regional Rd. 84 (Moyer Rd.); east on Biggar Rd. (Regional Rd. 47) to P1-27E	-	2 2 crossings of Grassy Brook	4	6	-	Moderate

APPENDIX V

OWTC Phase 3
Biology Factor Sheets

APPENDIX V: FACTOR SHEETS

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TABLE V.1 IDENTIFICATION OF SITE AREAS FACTORS

FACTORS:

- SEUs
- NON-SEU WOODLOTS >20 HA IN SIZE
- OTHER LANDS

TABLE V.1 ONWC PHASE 3 - FACTORS FOR IDENTIFICATION OF SITE AREAS

FACTOR GROUPING:	**FACTOR:**
Physical and Biological Environment	**Significant Environmental Units (SEUs)**

FACILITY COMPONENTS AFFECTED: **All Facility Components**

DEFINITION OF FACTOR:

Significant Environmental Unit (SEU) is a term coined to refer collectively to a number of types of areas which contain special environmental attributes or which perform significant environmental functions. SEUs have been identified in existing reports.

Component types of SEUs include:

- Environmentally Significant (Sensitive) Areas - ESAs
- Areas of Natural and Scientific Interest - ANSIs
- Areas of Important Biological Resources - AIBRs

RATIONALE/SIGNIFICANCE:

This factor related to the objectives to avoid destruction and minimize disruptions of significant landforms, significant ecosystems, vegetation or wildlife populations and rare or uncommon species.

SEUs may:

- contain populations of rare or uncommon plants or animals
- perform significant environmental functions
- provide habitat for species which require extensive territories
- contain biological associations or communities which are poorly represented elsewhere
- maintain a significant warm water fishery which provides fishing opportunities
- serve as cold water fishery migratory routes
- contain habitat for, or populations of, recreationally or economically important species e.g. bait fish
- represent significant earth science features

SEU mapping indicates the location and geographic extent of areas known to possess significant environmental features and/or to perform significant environmental functions. Recognition of these units during the planning process will assist in avoiding and minimizing impacts on known significant environmental resources.

TABLE V.1 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF SITE AREAS

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

SOURCES OF INFORMATION:

Reports which identify SEUs in drainage basins and Regional Municipalities located within the Candidate Areas were utilized. Only regional overview studies and types of analyses which were applied in all Candidate Areas were accessed. Environmental feature data contained in local planning documents such as a city's official plan were not used since the approach to and scope of identification of significant environmental features and designation assigned may vary from plan to plan.

Sources used included reports prepared by or for Conservation Authorities and Regional Municipalities, Ministry of Natural Resources' Areas of Natural and Scientific Interest files, District Land Use Guidelines, a fish migration route map and discussion with Conservation Authorities, Municipalities and Ministry of Natural Resources District and Regional and Head Office staff.

INTERPRETATION/METHODOLOGY:

The location and geographic extent of areas containing significant environmental features were mapped. Where boundaries of units overlapped or were contiguous they were combined and an amalgamated unit was mapped.

All SEUs mapped represent features or functions of significance. No interpretation was made to determine relative significance among the various SEUs.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- Although field work for certain of the reports utilized was conducted up to 9 years ago, and the status of species which justified designation in the past may have changed, habitat for significant species is probably still intact in most of the SEUs.
- At the present regional overview level of investigation, existing reports were the prime source of information. Extensive communications with government personnel, local naturalists and sportsmen might have revealed additional areas which would qualify as SEUs.
- Most of the SEUs are not designated as such in approved official plans of Regional Municipalities.
- Limitations in the scale or quality of mapping for certain AIBRs and ANSIs limited the accuracy with which certain SEU boundaries could be delineated on the 1:50,000 scale SEU inventory maps.

TABLE V.1 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF SITE AREAS

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

COMMENTS/ASSUMPTIONS/LIMITATIONS: (cont'd)

- Despite the limitations indicated above, consideration of SEUs during the site selection process is imperative as these areas are known to contain significant environmental features and to be of concern to certain agencies.

RISKS: L-H:

Since most SEUs do not contain high human population densities and do not support agricultural crops, operation of a facility within an SEU would be expected to result in a low risk to human health. Ingestion of wildland foods harvested in SEUs represent a potential pathway for creating a contaminant impact on human health. A release of contaminants to the environment surrounding the facility is an assumption in the impact on human health scenario.

A moderate to high risk situation could develop if the following series of events occurred in sequence.

(a) facilities were developed adjacent to an area where concentrations of migratory fish and game occur,

(b) a spill occurs and contaminates the fish and animals,

(c) the load of contaminants borne by the fish or animals is not great enough to kill or disable it,

(d) the contaminated fish or game leave the site and are captured and ingested by humans in another locale,

(e) the chemicals are deleterious to human health and a load sufficient to create a health risk is ingested by some individuals.

The probability of this scenario occurring is quite low, but the risk to certain humans might be high if this situation did develop.

It would be possible to effectively control harvest of wildland foods on site.

TABLE V.1 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF SITE AREAS

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

IMPACTS: H:

The potential for creating an environmental impact of concern is high because (a) SEUs contain environmental resources; and (b) the environmental attributes or functions present are documented to be of significance.

Construction on treed SEUs may result in (a) removal of vegetation which provides wildlife habitat, (b) and/or loss of significant plant and tree species. Changes in drainage and vegetation patterns, noise and vehicle activity might directly or indirectly change conditions for uncommon and other species, to the extent that biological functions, associations and communities are altered. Vegetation removal along watercourses may change temperatures and energetics.

LEVEL OF CONFIDENCE: H:

A number of sources of regional overview information have been used. Although environmental conditions may be dynamic, the basic settings and associated habitat remain similar. We are confident that the possiblity of encountering significant environmental attributes and/or functions is high within SEUs. This is substantiated by a careful review of site accounts for several SEUs and by the observation that some individual SEUs have been recognized within more than one information source.

These areas have been identified by study teams charged with the responsiblity of identifying significant environmental features or functions within a Regional Municipality, a drainage area or an administrative District, e.g. MNR. These teams have determined that the areas mapped as SEUs, are the key units of environmental significance within the context of their study scope and area.

* L = Low H = High

TABLE V.1 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF SITE AREAS

FACTOR GROUPING:	**FACTOR:**
Physical and Biological Environment	**Non-SEU Woodlots >20 ha in Size**

FACILITY COMPONENTS AFFECTED: **All Facility Components**

DEFINITION OF FACTOR:

Wooded areas which are not Significant Environmental Units but which are greater than 20 ha in area. Most of these areas are not designated in regional official plans.

RATIONALE/SIGNIFICANCE:

This factor documents the presence of a vegetated unit which may have value as a forestry or recreational resource or it may provide wildlife habitat. This factor flags areas which may have potential for significance but may not have been studied during ESA or other inventories.

SOURCES OF INFORMATION:

Primarily identified by interpretation of aerial photographs and reference to 1:50,000 scale topographic maps. The significance and use of these woodlots could be determined through discussions with landowners and government officials and site examination, but this is not deemed necessary at the present scale of investigation.

INTERPRETATION/METHODOLOGY:

Boundaries of woodlots were verified by checking those on the topographic sheets against the aerial photos. Only treed units were mapped.

TABLE V.1	OWMC PHASE 3 - FACTORS FOR IDENTIFICATION OF SITE AREAS
FACTOR GROUPING: Physical and Biological Environment	**FACTOR:** Non-SEU Woodlots >20 ha in Size

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- The significance of specific non-SEU woodlots >20 ha in area is not known.
- Although it is assumed that these woodlots are relatively less significant than are SEUs certain of these woodlots may contain resources which would qualify them as ESAs.
- Little or no information is available on most of the woodlots.
- Size of these woodlots is not necessarily indicative of the relative significance of each woodlot, rather adjacent land use, woodlot size, shape and location relative to watercourses and other woodlots would influence the significance of these woodlots for wildlife.
- The location of woodlot boundaries must be assumed to be approximate as vegetation succession, wood cutting and land development may have altered woodlot edges since the aerial photos were taken.

RISKS: L-M:

As with SEUs, impacts on human health would be indirect by way of ingestion of contaminated food harvested from the wild. Most of these woodlots are fairly small and few are adjacent to major waterways. It would be relatively simple to control use of the biological resources within a woodlot if accidental contamination occurred. Few of these woodlots are thought to contain habitat which would support migratory waterfowl or fish populations - so the risk of off-site migration of contaminated fish and wildlife is low.

IMPACTS: L-M:

Although little is presently known about many of these woodlots we assume that some of them perform important ecological functions and that some may harbour significant species. Tree clearing, drainage changes, siltation of watercourses are all potential impacts. Although impacts will depend on conditions present in each woodlot the probability of impacting rare or uncommon species may be relatively lower than in SEUs.

TABLE V.1 OWMC PHASE 3 - FACTORS FOR IDENTIFICATION OF SITE AREAS

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Non-SEU Woodlots >20 ha in Size

LEVEL OF CONFIDENCE: L-M:

The accuracy of our predictions at this time is hampered by a lack of site specific information on these woodlots.

L = Low M = Moderate

TABLE V.1 OMPC PHASE 3 - FACTORS FOR IDENTIFICATION OF SITE AREAS

FACTOR GROUPING:	**FACTOR:**
Physical and Biological Environment	Non-SEUs, Cleared Areas and Small Wooded Areas (Other Lands)

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Lands within the candidate areas which are neither SEU nor non-SEU woodlots larger than 20 ha in size. These are blank areas, within the candidate areas, on maps in the pocket of this report. Many of these areas have been cleared of trees and probably support such land uses as utility corridors, residential development, or agriculture.

RATIONALE/SIGNIFICANCE:

Since this factor includes all lands that are not SEUs or non-SEU woodlots, presumably little or no information is available on environmental resources, and presumably, based on size alone, may not have potential value as a forestry or recreational resource, or may not provide significant wildlife habitat. Thus, the probability of disturbing significant natural habitat is low.

SOURCES OF INFORMATION:

Identified solely on the basis of what lands remained after mapping SEUs and non-SEU woodlots. Interpretation of aerial photographs was used to distinguish small wooded areas from orchards.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- Little or no information is available for these lands.
- It is assumed at this time that these lands are of less significance and of less value as wildlife habitat than SEUs and non-SEU woodlots.
- Results of detailed specific on-site investigations may justify future designations of portions of these "other" lands as SEUs.
- Grain fields, vineyards and orchards are often used by wildlife as a food source, thus agricultural land use may provide benefits to certain species.

TABLE V.1	OWMC PHASE 3 - FACTORS FOR IDENTIFICATION OF SITE AREAS
FACTOR GROUPING: Physical and Biological Environment	**FACTOR:** Non-SEUs, Cleared Areas and Small Wooded Areas (Other Lands)

RISKS: L-H:

As with non-SEU woodlots and SEUs, impacts to human health would be indirect. It would occur by way of ingestion of waterfowl or wildlife which had consumed contaminated food from such agricultural areas as grain fields, orchards, and vineyards, or by way of ingestion of fish taken from contaminated streams. Since little is known about the utilization of these lands by wildlife, or the human consumption of the wildlife, the risk to human health is tentatively considered low.

However, if such lands support residential use, the risk to human health could be increased by facility development nearby.

IMPACTS: L:

Comparatively little is known about the environmental resources on these lands. Although impacts will vary with different land categories, such impacts as tree-clearing and drainage alteration could be expected. The probability of impacting upon those features identified as criteria for SEU designations will be comparatively low.

LEVEL OF CONFIDENCE: L-M:

Since comparatively little is known about the environmental resources on these lands, the probability of encountering significant resources is unknown. Without site-specific information, the probability is assumed at this time to be less than for SEUs and potentially at par with non-SEU woodlots.

Table V.2 Identification of Potential Sites Factors

- Step 1 -

Factors:

- SEUs
- Non-SEU Woodlots >20 Ha in size
- Other Lands

TABLE V.2 ONMC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - STEP 1

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Significant Environmental Unit (SEU) is a term coined to refer collectively to a number of types of areas which contain special environmental attributes or which perform significant environmental functions. SEUs have been identified in existing reports

Component types of SEUs include:

- Environmentally Significant (Sensitive) Areas - ESAs
- Areas of Natural and Scientific Interest - ANSIs
- Areas of Important Biological Resources - AIBRs

RATIONALE/SIGNIFICANCE:

This factor related to the objectives to avoid destruction and minimize disruption of significant landforms, significant ecosystems, vegetation or wildlife populations and rare or uncommon species.

SEUs may:

- contain populations of rare or uncommon plants or animals
- perform significant environmental functions
- provide habitat for species which require extensive territories
- contain biological associations or communities which are poorly represented elsewhere
- maintain a significant warm water fishery which provides fishing opportunities
- serve as cold water fishery migratory routes
- contain habitat for, or populations of, recreationally or economically important species e.g. bait fish
- represent significant earth science features

SEU mapping indicates the location and geographic extent of areas known to possess significant environmental features and/or to perform significant environmental functions. Recognition of these units during the planning process will assist in avoiding and minimizing impacts on known significant environmental resources.

TABLE V.2 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - STEP 1

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

SOURCES OF INFORMATION:

Reports which identify SEUs in drainage basins and Regional Municipalities located within the Candidate Areas were utilized. Only regional overview studies and types of analyses which were applied in all Candidate Areas were accessed. Environmental feature data contained in local planning documents such as a city's official plan were not used since the approach to and scope of identification of significant environmental features and designation assigned may vary from plan to plan.

Sources used included reports prepared by or for Conservation Authorities and Regional Municipalities, Ministry of Natural Resources' Areas of Natural and Scientific Interest files, District Land Use Guidelines, a fish migration route map and discussion with Conservation Authorities, Municipalities and Ministry of Natural Resources District and Regional and Head Office staff. The presence of Carolinian plant species was the reason for designating many environmentally significant areas. Early during the identification of potential sites we discussed the status of the species of trees and shrubs which had led to identification of many SEUs with botanical experts. As a result of these discussions the rationale for designation of many of the SEUs was substantiated.

TABLE V.2 OMMC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - STEP 1

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

INTERPRETATION/METHODOLOGY:

The location and geographic extent of areas containing significant environmental features were mapped. Where boundaries of units overlapped or were contiguous they were combined and an amalgamated unit was mapped.

All SEUs mapped represent features or functions of significance. No interpretation was made to determine relative significance among the various SEUs.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- Although field work for certain of the reports utilized was conducted up to 9 years ago, and the status of species which justified designation in the past may have changed, habitat for significant species is probably still intact in most of the SEUs.
- At the present regional overview level of investigation, existing reports were the prime source of information. Extensive communications with government personnel, local naturalists and sportsmen might have revealed additional areas which would qualify as SEUs.
- Most of the SEUs are not designated as such in approved official plans of Regional Municipalities.
- Limitations in the scale or quality of mapping for certain AIBRs and ANSIs limited the accuracy with which certain SEU boundaries could be delineated on the 1:50,000 scale SEU inventory maps.
- Despite the limitations indicated above, consideration of SEUs during the site selection process is imperative as these areas are known to contain significant environmental features and to be of concern to certain agencies.
- Discussions with botanical experts confirmed the special status of certain Carolinian plant species in Ontario. This is significant since the presence of Carolinian species played a major role in designation of many environmentally significant areas.

TABLE V.2 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES STEP 1

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Non-SEU Woodlots >20 ha in Size

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Wooded areas which are not Significant Environmental Units but which are greater than 20 ha in area. Most of these areas are not designated in regional official plans.

RATIONALE/SIGNIFICANCE:

This factor documents the presence of a vegetated unit which may have value as a forestry or recreational resource or it may provide wildlife habitat. This factor flags areas which may have potential for significance but may not have been studied during ESA or other inventories.

SOURCES OF INFORMATION:

Primarily identified by interpretation of aerial photographs and reference to 1:50,000 scale topographic maps. The significance and use of these woodlots could be determined through discussions with landowners and government officials and site examination, but this is not deemed necessary at the present scale of investigation.

INTERPRETATION/METHODOLOGY:

Boundaries of woodlots were verified by checking those on the topographic sheets against the aerial photos. Only treed units were mapped.

TABLE V. 2 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES STEP 1

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Non-SEU Woodlots >20 ha in Size

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- The significance of specific non-SEU woodlots >20 ha in area is not known.
- Although it is assumed that these woodlots are relatively less significant than are SEUs certain of these woodlots may contain resources which would qualify them as ESAs.
- Little or no information is available on most of the woodlots.
- Size of these woodlots is not necessarily indicative of the relative significance of each woodlot, rather adjacent land use, woodlot size, shape and location relative to watercourses and other woodlots would influence the significance of these woodlots for wildlife.
- The location of woodlot boundaries must be assumed to be approximate as vegetation succession, wood cutting and land development may have altered woodlot edges since the aerial photos were taken.

TABLE V. 2 OWMC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES STEP 1

FACTOR GROUPING:	**FACTOR:**
Physical and Biological Environment	Non-SEUs, Cleared Areas and Small Wooded Areas (Other Lands)

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Lands within the candidate areas which are neither SEU nor non-SEU woodlots larger than 20 ha in size. These are blank areas, within the candidate areas, on maps in the pocket of this report. Many of these areas have been cleared of trees and probably support such land uses as utility corridors, residential development, or agriculture.

RATIONALE/SIGNIFICANCE:

Since this factor includes all lands that are not SEUs or non-SEU woodlots, presumably little or no information is available on environmental resources, and presumably, based on size alone, may not have potential value as a forestry or recreational resource, or may not provide significant wildlife habitat. Thus, the probability of disturbing significant natural habitat is low.

SOURCES OF INFORMATION:

Identified solely on the basis of what lands remained after mapping SEUs and non-SEU woodlots. Interpretation of aerial photographs was used to distinguish small wooded areas from orchards.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- Little or no information is available for these lands.
- It is assumed at this time that these lands are of less significance and of less value as wildlife habitat than SEUs and non-SEU woodlots.
- Results of detailed specific on-site investigations may justify future designations of portions of these "other" lands as SEUs.
- Grain fields, vineyards and orchards are often used by wildlife as a food source, thus agricultural land use may provide benefits to certain species.

TABLE V.3 IDENTIFICATION OF POTENTIAL SITES FACTORS

- STEP 2 -

FACTORS:

- SEUs
- NON-SEU WOODLOTS >20 HA IN SIZE
- OTHER VEGETATION
- AQUATIC HABITAT
- TERRESTRIAL WILDLIFE HABITAT

TABLE V. 3 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - STEP 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Significant Environmental Unit (SEU) is a term coined to refer collectively to a number of types of areas which contain special environmental attributes or which perform significant environmental functions. SEUs have been identified in existing reports

Component types of SEUs include:

- Environmentally Significant (Sensitive) Areas - ESAs
- Areas of Natural and Scientific Interest - ANSIs
- Areas of Important Biological Resources - AIBRs

RATIONALE/SIGNIFICANCE:

This factor related to the objectives to avoid destruction and minimize disruption of significant landforms, significant ecosystems, vegetation or wildlife populations and rare or uncommon species.

SEUs may:

- contain populations of rare or uncommon plants or animals
- perform significant environmental functions
- provide habitat for species which require extensive territories
- contain biological associations or communities which are poorly represented elsewhere
- maintain a significant warm water fishery which provides fishing opportunities
- serve as cold water fishery migratory routes
- contain habitat for, or populations of, recreationally or economically important species e.g. bait fish
- represent significant earth science features

SEU mapping indicates the location and geographic extent of areas known to possess significant environmental features and/or to perform significant environmental functions. Recognition of these units during the planning process will assist in avoiding and minimizing impacts on known significant environmental resources.

TABLE V. 3 OMMC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - STEP 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

SOURCES OF INFORMATION:

Reports which identify SEUs in drainage basins and Regional Municipalities located within the Candidate Areas were utilized. Only regional overview studies and types of analyses which were applied in all Candidate Areas were accessed. Environmental feature data contained in local planning documents such as a city's official plan were not used since the approach to and scope of identification of significant environmental features and designation assigned may vary from plan to plan.

Sources used included reports prepared by or for Conservation Authorities and Regional Municipalities, Ministry of Natural Resources' Areas of Natural and Scientific Interest files, District Land Use Guidelines, a fish migration route map and discussion with Conservation Authorities, Municipalities and Ministry of Natural Resources District and Regional and Head Office staff. The presence of Carolinian plant species was the reason for designating many environmentally significant areas. Early during the identification of potential sites we discussed the status of the species of trees and shrubs which had led to identification of many SEUs with botanical experts. As a result of these discussions the rationale for designation of many of the SEUs was substantiated.

TABLE V. 3 OMMC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - STEP 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

INTERPRETATION/METHODOLOGY:

The location and geographic extent of areas containing significant environmental features were mapped. Where boundaries of units overlapped or were contiguous they were combined and an amalgamated unit was mapped.

All SEUs mapped represent features or functions of significance. No interpretation was made to determine relative significance among the various SEUs.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- Although field work for certain of the reports utilized was conducted up to 9 years ago, and the status of species which justified designation in the past may have changed, habitat for significant species is probably still intact in most of the SEUs.
- At the present regional overview level of investigation, existing reports were the prime source of information. Extensive communications with government personnel, local naturalists and sportsmen might have revealed additional areas which would qualify as SEUs.
- Most of the SEUs are not designated as such in approved official plans of Regional Municipalities.
- Limitations in the scale or quality of mapping for certain AIBRs and ANSIs limited the accuracy with which certain SEU boundaries could be delineated on the 1:50,000 scale SEU inventory maps.
- Despite the limitations indicated above, consideration of SEUs during the site selection process is imperative as these areas are known to contain significant environmental features and to be of concern to certain agencies.
- Discussions with botanical experts confirmed the special status of certain Carolinian plant species in Ontario. This is significant since the presence of Carolinian species played a major role in designation of many environmentally significant areas.

TABLE V.3 OMPC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES
STEP 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Non-SEU Woodlots >20 ha in Size

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Wooded areas which are not Significant Environmental Units but which are greater than 20 ha in area. Most of these areas are not designated in regional official plans.

RATIONALE/SIGNIFICANCE:

This factor documents the presence of a vegetated unit which may have value as a forestry or recreational resource or it may provide wildlife habitat. This factor flags areas which may have potential for significance but may not have been studied during ESA or other inventories.

SOURCES OF INFORMATION:

Primarily identified by interpretation of aerial photographs and reference to 1:50,000 scale topographic maps. The significance and use of these woodlots could be determined through discussions with landowners and government officials and site examination, but this is not deemed necessary at the present scale of investigation.

INTERPRETATION/METHODOLOGY:

Boundaries of woodlots were verified by checking those on the topographic sheets against the aerial photos. Only treed units were mapped.

TABLE V. 3 OMMC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES
STEP 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Non-SEU Woodlots >20 ha in Size

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- The significance of specific non-SEU woodlots >20 ha in area is not known.
- Although it is assumed that these woodlots are relatively less significant than are SEUs certain of these woodlots may contain resources which would qualify them as ESAs.
- Little or no information is available on most of the woodlots.
- Size of these woodlots is not necessarily indicative of the relative significance of each woodlot, rather adjacent land use, woodlot size, shape and location relative to watercourses and other woodlots would influence the significance of these woodlots for wildlife.
- The location of woodlot boundaries must be assumed to be approximate as vegetation succession, wood cutting and land development may have altered woodlot edges since the aerial photos were taken.

TABLE V.3 ONWC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - Step 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Other Vegetation

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

This factor applies to patches of woody vegetation on-site which are less than 20 ha in size and have no SEU designation associated with them.

RATIONALE/SIGNIFICANCE:

Other vegetation contributes to defining the extent of natural vegetation cover on sites. The extent and pattern of all vegetation types is an important consideration in assessing terrestrial wildlife habitat.

This factor relates to the goal to minimize environmental impact. There is a need to be aware of these vegetation units since they may provide habitat for significant wildlife species and/or may contribute to important environmental functions.

SOURCES OF INFORMATION:

Brief field observations during Step 2 of identification of potential sites and air photo interpretation.

INTERPRETATION/METHODOLOGY:

Boundaries of units were determined from air photos. Winter field observations allowed confirmation of boundaries and general character of natural vegetation units.

TABLE V.3 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - Step 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Other Vegetation

CRITERIA/INDICATORS:

Other vegetation areas were those lands occupied by natural vegetation which were not SEUs or Non-SEU woodlots >20 ha in size.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

Field checking of the boundaries and character of "other vegetation" units was restricted by the need to stay on public roadways and by the season.

TABLE V.3 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - Step 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Aquatic Habitat

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Portions of sites covered by water bodies, primarily drainage channels, streams and small ponds

RATIONALE/SIGNIFICANCE:

Aquatic systems add to the habitat diversity of an area and influence the variety of fish and wildlife present. Thus, the type and number of water bodies warrants attention during site comparison.

This factor relates to the goal of minimizing environmental impact. There is a need to be aware of aquatic habitat since it might provide habitat for significant fish and wildlife species and/or may contribute to important environmental functions.

SOURCES OF INFORMATION:

Field observations during Step 2 of identification of potential sites and air photo interpretation.

INTERPRETATION/METHODOLOGY:

Location of water bodies was determined from air photos. Winter field observations from public roadways provided an opportunity to examine streams at property boundaries.

This assessment did not address the quality of aquatic habitat for fish and wildlife since changes in water volume, quality and physical characteristics of the habitat were not known.

TABLE V.3 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - Step 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Aquatic Habitat

CRITERIA/INDICATORS:

All types of water bodies on sites present were recorded. Intermittent streams and drainage channels were also noted.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

Winter field observations from public roadways limited the detail regarding the number and characteristics of water bodies on sites. It was assumed that water bodies on the sites have some value as aquatic habitat. However, since most of the streams are intermittent and the ponds are small, none of them are thought to be of unusual significance.

TABLE V.3 OMOC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - Step 2	
FACTOR GROUPING: Physical and Biological Environment	**FACTOR:** Terrestrial Wildlife Habitat
FACILITY COMPONENTS AFFECTED: All Facility Components	

DEFINITION OF FACTOR:

Terrestrial wildlife habitat is the set of conditions required by land-based wildlife species.

RATIONALE/SIGNIFICANCE:

The presence of habitat indicates the potential for wildlife populations on sites. This factor relates to the goal to minimize environmental impact. There is a need to be aware of wildlife habitat since it may harbour significant species and/or contribute to wildlife related environmental functions.

SOURCES OF INFORMATION:

Field observations during Step 2 of identification of potential sites and air photo interpretation. Examination of SEUs, non-SEU woodlots >20 ha and other vegetation.

INTERPRETATION/METHODOLOGY:

Potential wildlife habitat was interpreted from an examination of vegetation extent, pattern and variety. Aquatic features and connections of on-site vegetation to surrounding wooded areas were also considerations in determining whether a site appears to possess wildlife habitat. Any direct observations of wildlife were noted in the field and summary comments on significant habitat were noted on the field form used during Step 2 of potential site identification.

In southern Ontario, wildlife communities are dominated by bird species, with certain mammals being present. Of most interest is high quality forest, old field and other habitats which support uncommon species. Sites which are noted as having wildlife habitat typically would contain one or more woodlots. Cultivated field or improved pasture were not considered to represent critical wildlife habitat although these vegetation types may form part of the habitat requirements of certain species.

TABLE V.3 OMMC PHASE 3 - FACTORS FOR IDENTIFICATION OF POTENTIAL SITES - Step 2

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Terrestrial Wildlife Habitat

CRITERIA/INDICATORS:

Natural vegetation extent, variety and pattern and presence of aquatic habitat contribute to interpretation of wildlife habitat. Connections to habitat on surrounding lands were also examined.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

Winter field observations were of limited value in confirming the number and characteristics of water bodies on-site. Also, field-checking of the boundaries and character of vegetation was limited by the season and the need to stay on public roadways.

Actual use of habitat by wildlife on all sites, except those which have been visited during environmentally significant areas (ESA) studies, was not known to the study team.

The quality and use of habitat on these sites is as yet unconfirmed. Thus, in the present exercise, the potential of sites to provide wildlife habitat, is being considered. The present analysis of habitat is preliminary in nature and concentrates on potential for woodland species.

TABLE V.4 IDENTIFICATION OF CANDIDATE SITES FACTORS - SITES

FACTORS:

- SEUs
- NON-SEUs >20 HA IN SIZE
- OTHER VEGETATION
- AQUATIC HABITAT
- TERRESTRIAL WILDLIFE HABITAT
- LOCAL SETTING

TABLE V. 4 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Significant Environmental Unit (SEU) is a term coined to refer collectively to a number of types of areas which contain special environmental attributes or which perform significant environmental functions. SEUs have been identified in existing reports

Component types of SEUs include:

- Environmentally Significant (Sensitive) Areas - ESAs
- Areas of Natural and Scientific Interest - ANSIs
- Areas of Important Biological Resources - AIBRs

RATIONALE/SIGNIFICANCE:

This factor related to the objectives to avoid destruction and minimize disruption of significant landforms, significant ecosystems, vegetation or wildlife populations and rare or uncommon species.

SEUs may:

- contain populations of rare or uncommon plants or animals
- perform significant environmental functions
- provide habitat for species which require extensive territories
- contain biological associations or communities which are poorly represented elsewhere
- maintain a significant warm water fishery which provides fishing opportunities
- serve as cold water fishery migratory routes
- contain habitat for, or populations of, recreationally or economically important species e.g. bait fish
- represent significant earth science features

SEU mapping indicates the location and geographic extent of areas known to possess significant environmental features and/or to perform significant environmental functions. Recognition of these units during the planning process will assist in avoiding and minimizing impacts on known significant environmental resources.

TABLE V. 4 OMMC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

SOURCES OF INFORMATION:

Reports which identify SEUs in drainage basins and Regional Municipalities located within the Candidate Areas were utilized. Only regional overview studies and types of analyses which were applied in all Candidate Areas were accessed. Environmental feature data contained in local planning documents such as a city's official plan were not used since the approach to and scope of identification of significant environmental features and designation assigned may vary from plan to plan.

Sources used included reports prepared by or for Conservation Authorities and Regional Municipalities, Ministry of Natural Resources' Areas of Natural and Scientific Interest files, District Land Use Guidelines, a fish migration route map and discussion with Conservation Authorities, Municipalities and Ministry of Natural Resources District and Regional and Head Office staff. The presence of Carolinian plant species was the reason for designating many environmentally significant areas. Early during the identification of potential sites we discussed the status of the species of trees and shrubs which had led to identification of many SEUs with botanical experts. As a result of these discussions the rationale for designation of many of the SEUs was substantiated.

TABLE V. 4 OWMC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Significant Environmental Units (SEUs)

INTERPRETATION/METHODOLOGY:

The location and geographic extent of areas containing significant environmental features were mapped. Where boundaries of units overlapped or were contiguous they were combined and an amalgamated unit was mapped.

All SEUs mapped represent features or functions of significance. No interpretation was made to determine relative significance among the various SEUs.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- Although field work for certain of the reports utilized was conducted up to 9 years ago, and the status of species which justified designation in the past may have changed, habitat for significant species is probably still intact in most of the SEUs.
- At the present regional overview level of investigation, existing reports were the prime source of information. Extensive communications with government personnel, local naturalists and sportsmen might have revealed additional areas which would qualify as SEUs.
- Most of the SEUs are not designated as such in approved official plans of Regional Municipalities.
- Limitations in the scale or quality of mapping for certain AIBRs and ANSIs limited the accuracy with which certain SEU boundaries could be delineated on the 1:10,000 scale potential site maps (Appendix III).
- Despite the limitations indicated above, consideration of SEUs during the site selection process is imperative as these areas are known to contain significant environmental features and to be of concern to certain agencies.
- Discussions with botanical experts confirmed the special status of certain Carolinian plant species in Ontario. This is significant since the presence of Carolinian species played a major role in designation of many environmentally significant areas.

TABLE V.4 OMPC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Non-SEU Woodlots >20 ha in Size

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Wooded areas which are not Significant Environmental Units but which are greater than 20 ha in area. Most of these areas are not designated in regional official plans.

RATIONALE/SIGNIFICANCE:

This factor documents the presence of a vegetated unit which may have value as a forestry or recreational resource or it may provide wildlife habitat. This factor flags areas which may have potential for significance but may not have been studied during ESA or other inventories.

SOURCES OF INFORMATION:

Primarily identified by interpretation of aerial photographs and reference to 1:50,000 scale topographic maps. The significance and use of these woodlots could be determined through discussions with landowners and government officials and site examination, but this is not deemed necessary at the present scale of investigation.

INTERPRETATION/METHODOLOGY:

Boundaries of woodlots were verified by checking those on the topographic sheets against the aerial photos. Only treed units were mapped.

TABLE V. 4 OWMC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Non-SEU Woodlots >20 ha in Size

COMMENTS/ASSUMPTIONS/LIMITATIONS:

- The significance of specific non-SEU woodlots >20 ha in area is not known.
- Although it is assumed that these woodlots are relatively less significant than are SEUs certain of these woodlots may contain resources which would qualify them as ESAs.
- Little or no information is available on most of the woodlots.
- Size of these woodlots is not necessarily indicative of the relative significance of each woodlot, rather adjacent land use, woodlot size, shape and location relative to watercourses and other woodlots would influence the significance of these woodlots for wildlife.
- The location of woodlot boundaries must be assumed to be approximate as vegetation succession, wood cutting and land development may have altered woodlot edges since the aerial photos were taken.

TABLE V.4 OMRE PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Other Vegetation

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

This factor applies to patches of woody vegetation on-site which are less than 20 ha in size and have no SEU designation associated with them.

RATIONALE/SIGNIFICANCE:

Other vegetation contributes to defining the extent of natural vegetation cover on sites. The extent and pattern of all vegetation types is an important consideration in assessing terrestrial wildlife habitat.

This factor relates to the goal to minimize environmental impact. There is a need to be aware of these vegetation units since they may provide habitat for significant wildlife species and/or may contribute to important environmental functions.

SOURCES OF INFORMATION:

Field observations during Step 2 of identification of potential sites.
Air photo interpretation of boundaries and cover types within "other vegetation" areas.

INTERPRETATION/METHODOLOGY:

Boundaries of units were determined from air photos as were the major vegetation cover types. Winter field observations provided for confirmation of boundaries and character of natural vegetation units.

TABLE V. 4 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Other Vegetation

CRITERIA/INDICATORS:

During vegetation cover type determination a number of categories were assigned: deciduous, coniferous, mixed, field hedgerow and thicket. Lowland and upland descriptors were also assigned. These cover types were assigned to all vegetation areas whether previously described as SEUs and Non-SEU woodlots >20 ha units or not.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

Field checking of boundaries of units and the character of vegetation was limited by seasonal timing and the need tc stay on public roadways. Vegetation cover type mapping has not been field checked.

TABLE V.4 OMPC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Aquatic Habitat

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Portions of sites covered by water bodies, primarily drainage channels, streams and small ponds

RATIONALE/SIGNIFICANCE:

Aquatic systems add to the habitat diversity of an area and influence the variety of fish and wildlife present. Thus, the type and number of water bodies warrants attention during site comparison.

This factor relates to the goal of minimizing environmental impact. There is a need to be aware of aquatic habitat since it might provide habitat for significant fish and wildlife species and/or may contribute to important environmental functions.

SOURCES OF INFORMATION:

Field observations during Step 2 of identification of potential sites and air photo interpretation.

INTERPRETATION/METHODOLOGY:

Location of water bodies was determined from air photos. Winter field observations from public roadways provided an opportunity to examine streams at property boundaries.

This assessment did not address the quality of aquatic habitat for fish and wildlife since changes in water volume, quality and physical characteristics of the habitat were not known.

TABLE V.4 OWMC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Aquatic Habitat

CRITERIA/INDICATORS:

All types of water bodies on sites present were recorded. Intermittent streams and drainage channels were also noted.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

Winter field observations from public roadways limited the detail regarding the number and characteristics of water bodies on sites. It was assumed that water bodies on the sites have some value as aquatic habitat. However, since most of the streams are intermittont and the ponds are small, none of them are thought to be of unusual significance.

TABLE V.4 OMPC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Terrestrial Wildlife Habitat

FACILITY COMPONENTS AFFECTED: All Facility Components

DEFINITION OF FACTOR:

Terrestrial wildlife habitat is the set of conditions required by land-based wildlife species.

RATIONALE/SIGNIFICANCE:

The presence of habitat indicates the potential for wildlife populations on sites. This factor relates to the goal to minimize environmental impact. There is a need to be aware of wildlife habitat since it may harbour significant species and/or contribute to wildlife related environmental functions.

SOURCES OF INFORMATION:

Field observations during Step 2 of identification of potential sites.
Air photo interpretation of vegetation cover types and aquatic habitat.

INTERPRETATION/METHODOLOGY:

Potential wildlife habitat was interpreted from an examination of vegetation extent, pattern and variety. Aquatic features and connections of on-site vegetation to surrounding wooded areas were also considerations in determining whether a site appears to possess wildlife habitat. Any direct observations of wildlife were noted in the field and summary comments on significant habitat were noted on the field form used during Step 2 of potential site identification.

TABLE V. 4 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Terrestrial Wildlife Habitat

CRITERIA/INDICATORS:

Natural vegetation extent, variety and pattern and presence of aquatic habitat contribute to interpretation of wildlife habitat. Connections to habitat on surrounding lands were also examined.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

Winter field observations were of limited value in confirming the number and characteristics of water bodies on-site. Also, field-checking of the boundaries and character of vegetation was limited by the season and the need to stay on public roadways.

Actual use of habitat by wildlife on all sites, except those which have been visited during environmentally significant areas (ESA) studies, was not known to the study team.

The quality and use of habitat on these sites is as yet unconfirmed. Thus, in the present exercise, the potential of sites to provide wildlife habitat, is being considered. The present analysis of habitat is preliminary in nature and concentrates on potential for woodland species.

TABLE V.4 OMNC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES	
FACTOR GROUPING: Physical and Biological Environment	**FACTOR:** Local Setting
FACILITY COMPONENTS AFFECTED: All Facility Components	

DEFINITION OF FACTOR:

This factor addresses the potential functional relationship between biological resources on a site and on adjacent lands.

RATIONALE/SIGNIFICANCE:

Biological systems e.g. habitat or animal territories are not necessarily defined by property boundaries. Vegetative or topographic connections to adjacent areas are often biologically important.

This factor relates to the goal to minimize environmental impact. By recognizing the significance of the site in relation to surrounding lands, interference with important environmental functions, e.g. wildlife travel corridors, can be avoided.

SOURCES OF INFORMATION:

Inventory of SEUs and non-SEUs >20 ha in size prepared during identification of site areas. Air photo interpretation of other vegetation and aquatic habitat. Interpretation of field observations obtained during Step 2 of identification of potential sites.

INTERPRETATION/METHODOLOGY:

A qualitative assessment of the relationship of vegetation and physical features on-site and on adjacent lands was completed.

The position of significant environmental units (SEUs), woodlots and other vegetation on-site relative to features of habitat significance on adjacent lands was examined. Connections from the site to adjacent wooded areas by hedgerows, watercourses etc. were noted.

TABLE V.4 OMMC PHASE 3 - FACTORS FOR IDENTIFICATION OF CANDIDATE SITES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Local Setting

CRITERIA/INDICATORS:

In the local setting analysis major watercourses, vegetation units and SEUs which extend off-site or may have an influence on site biology were noted. The relationship of vegetation on the site and adjacent lands is thus of primary significance in describing local setting.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

This factor recognizes the fact that biological systems are not defined by or confined within property boundaries. Although the site acquisition boundaries are a convenient reference for defining the implications of certain activities on the natural environment (e.g. vegetation clearing for facility construction), assessment of environmental constraints associated with a site cannot be defined simply on the basis of conditions within the acquisition limits. This is the case because certain changes e.g. elevated noise and traffic levels may have impacts on wildlife in adjacent areas.

Prediction of levels of development constraint will also depend on how biological systems on potential sites are connected to, or relate to, those on adjacent lands.

TABLE V.5 IDENTIFICATION OF CANDIDATE SITES - ACCESS ROUTES

FACTOR: STREAM CROSSINGS

Table V.5

OMNC PHASE 3 - IDENTIFICATION OF CANDIDATE SITES FACTOR - ACCESS ROUTES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Stream Crossings

FACILITY COMPONENTS AFFECTED: All facility components

DEFINITION OF FACTOR: Biology was used to assist in analysis of access routes so that the objectives to minimize impact on the natural environment and human health would be attained. Stream crossings is the factor used. Crossings of streams containing important fish populations were highlighted.

RATIONALE/SIGNIFICANCE:

Objectives of the site selection process include choosing sites at locations which can be accessed without creating major environmental impacts.

Crossings of significant fishery habitat represent locations at which a spill of wastes might create a local or downstream impact.

Avoiding contamination of aquatic life and habitat would also assist in achieving the objective to avoid contamination of food chains, e.g. flesh of fish and game.

SOURCES OF INFORMATION:

Topographic maps were used to identify locations of streams. Our data base on sensitive uses was limited to reports dealing with fish populations, e.g. MNR District Land Use Guidelines and migratory stream maps and very limited information on major inland water intakes, information which had been assembled to prepare the surface water report. No information was researched on livestock watering nor were the Ministry of the Environment's "Permit To Take Water" files. Permanence of flow was interpreted from size of drainage basin upstream of the crossing point and its designation on the topo map.

INTERPRETATION/METHODOLOGY:

Locations of stream crossings were mapped and numbered. Tables were prepared in which the number of crossings of streams with sensitive uses, and crossings of other permanent and intermittent streams were recorded. An overall significance was determined. Where one or more crossings of significant fisheries streams were crossed a major constraint was assigned. If only two or three intermittent streams were crossed a no constraint interpretation would be assigned.

Table V.5

OWMC PHASE 3 - IDENTIFICATION OF CANDIDATE SITES FACTOR - ACCESS ROUTES

FACTOR GROUPING:	FACTOR:
Physical and Biological Environment	Stream Crossings

CRITERIA/INDICATORS:

Type of watercourse was determined by interpreted flow permanence and whether the stream or river was known to support important fisheries. Important fisheries e.g. salmonid runs or warm water game fish were considered to be significant uses.

COMMENTS/ASSUMPTIONS/LIMITATIONS:

This was a preliminary assessment of access routes based on limited data. The results should be viewed only as providing a relative comparison of alternative access routes. Neither permanence of stream flow nor sensitive uses were confirmed by field work nor research of government files.

More detailed studies of access to candidate sites will be necessary during Phase 4.

APPENDIX VI

CANDIDATE AREA 17

The following is quoted from Volume 1 of the Site Selection Process Report (Dillon, 1984):

"In the OWMC Phase 3 Interim Report (May 1983) a series of 19 candidate areas were identified which were considered suitable for various facility components. One of the factors which was employed in the delineation of candidate areas was travel time from the 400 series highways. More particularly the portion of the candidate region which was beyond the 30 minute travel time contour was excluded from further consideration. In addition to the disadvantage of being relatively inaccessible from major highways this area was also recognized as not possessing off-setting advantages as compared with the larger and more accessible candidate areas in terms of: industrially designated or publicly held lands; geologic/hydrogeologic conditions; surface water; agricultural productivity or capability; or population density" (OWMC 1983. p31).

In the course of reviewing the Phase 3A analysis an error and an inconsistency were identified which affected tne placement of the 30 minute travel time contour. As indicated in Figures C.1 and C.2 the replotting of the contour resulted in a southerly extension of candidate areas 17 and 8. Once the boundaries of these candidate areas were redefined these additional areas were subject to the same level of analysis undertaken for the other candidate areas. This appendix briefly describes the results of these additional investigations. The role of the other site selection consultants in this analysis are highlighted in their Phase 3B site selection reports.

Candidate Area 17 is suitable for integrated or landfill only facility components based on soil depth and consistency characteristics as defined by Gartner Lee Associates. (Gartner Lee Associates Ltd. 1984. Geologic and Hydrogeologic Inventory of the Golden Horseshoe Candidate Region and Ontario Waste Management Corporation, 1983. Facilities Development Process; Phase 3 Interim Report). Candidate Area 17 is also hydrogeologically suitable for incinerator/physical treatment facilities. As a result of more shallow silt-clay soils Candidate Area 8 is only hydrogeologically suitable for an incinerator and/or a physical/chemical treatment plant.

With the application of the site area identification agricultural exclusionary factors by Ecologistics Ltd. all but three areas within Candidate Area 17 were found to contain exclusionary constraints for the establishment of the integrated/landfill facility components. Two of those areas were found to be too small and irregularly shaped to accommodate a landfill facility (110 ha). The third area appeared to meet the minimum size requirement."

Gartner Lee was requested to map Significant Environmental Units (SEUs) in the additional portion of Candidate Area 17. SEU 17-1 extends south into this area (see Figure G-B24).

This large SEU covers approximately two-thirds of the area noted above, which appeared to meet the minimum site size requirement. Again quoting from the Dillon Site Selection Process - Volume 1 report:

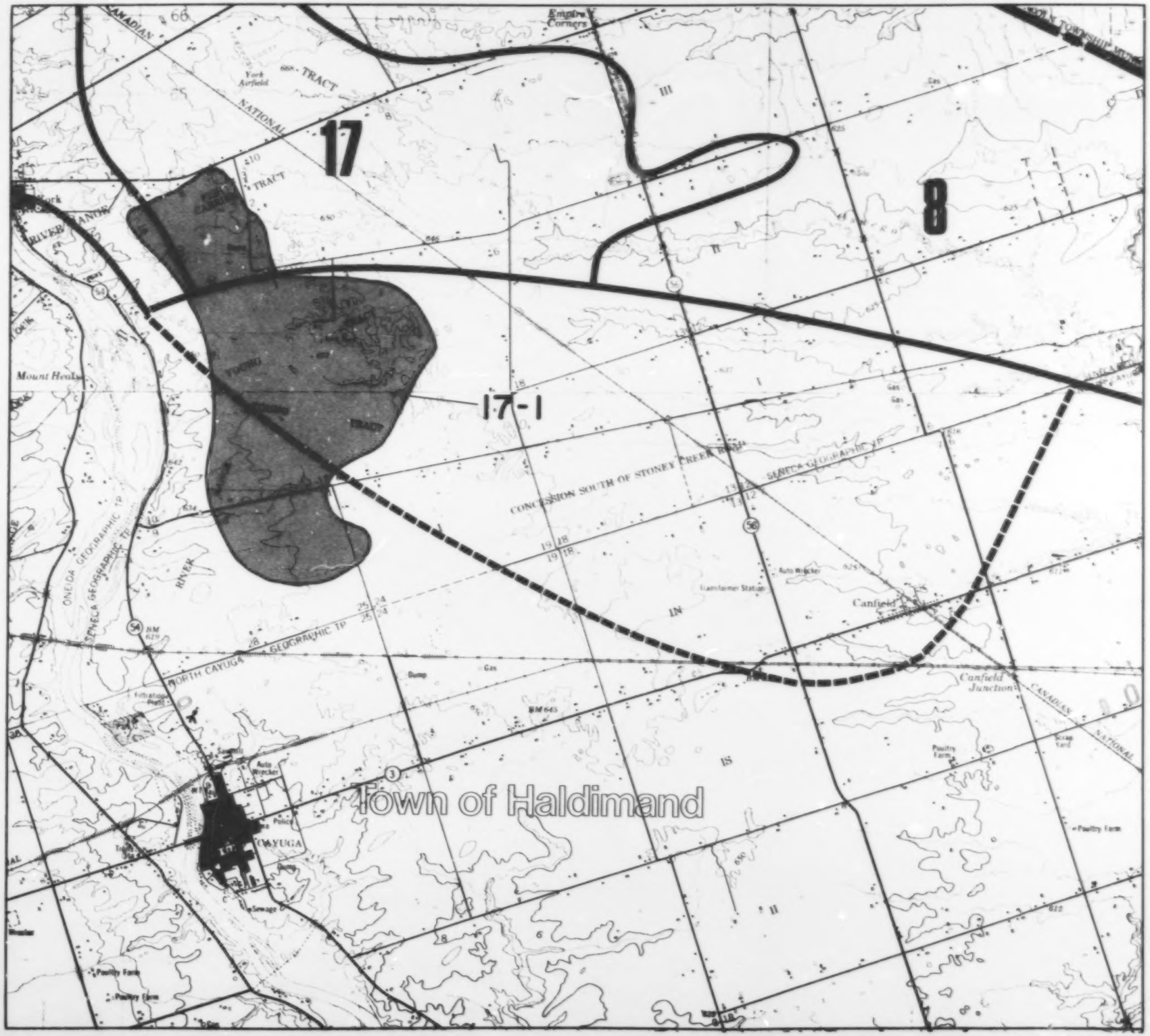
OWMC Ontario Waste Management Corporation

Consultant: Gartner Lee Associates Limited

Legend:

Extensive Areas of Environmental Significance

17-1 — Candidate Area Number / Unit Number



1 mile / 2 kilometres — 0 — 1000 metres — scale 1:50 000

Biological Resources
SITE AREA IDENTIFICATION

October 1984 **FIGURE G·B 24**

"The entire SEU falls within the constraint-free area. The Gartner Lee interpretation of this SEU's characteristics was that, it was of sufficient significance and sensitivity that consistent with the potential site identification exclusionary factors (Volume 2) the SEU should be treated as exclusionary. The remaining constraint-free area which is not covered by SEU 17-1 is too small and is irregularly shaped and will not accommodate a landfill/integrated facility. On the basis of these constraints, the site selection team concluded that this additional area was not suitable for a landfill or fully integrated facility components."

POOR

QUALITY

ORIGINAL